United States Department of the Interior

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Memorandum

DEC 17 1999

To: Chief, Division of Consultation and Conservation Planning, Ecological Services, Region 1, North Pacific Coast Ecoregion, Portland, Oregon
(Attention: Larry Salata)

From: Manager, Western Washington Office, North Pacific Coast Ecoregion, Lacey, Washington

Subject: Reinitiation of Intra-Service Biological Opinion on the Modification of the Cascades Habitat Conservation Plan resulting from the Interstate-90 Land Exchange between Plum Creek Timber Company and the U.S. Forest Service within King and Kittitas Counties, Washington. Reference: Incidental Take Permit (PRT-808398) (FWS Reference: 1-3-00-FR-0245; X-Reference: 1-3-96-FW-190; 1-3-98-FR-0357).

This document constitutes the U.S. Fish and Wildlife Service's (Service) reinitiation of a Biological Opinion (USFWS 1996a) with respect to a section 10(a)(1)(B) Incidental Take Permit (Permit) previously issued to Plum Creek Timber Company, L.P. (currently Plum Creek Timber Company, Inc.)(Plum Creek), based upon the Habitat Conservation Plan (HCP)(Plum Creek 1996) and Implementation Agreement (IA)(Plum Creek et al. 1996), in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended, (16 U.S.C. 1536 et seq.)(Act). This reinitiation of consultation addresses the effects of a modification to the HCP to incorporate the changes in the land-base which result from the Interstate-90 Land Exchange (Land Exchange) between Plum Creek and the Forest Service. The modification of the HCP would only affect the original HCP Planning Area in portions of King and Kittitas Counties, Washington. At the time of initial Permit issuance, a land exchange was anticipated and procedures were provided within the HCP and IA to facilitate the incorporation of a new land-base into the HCP. At this time, consultation is being reinitiated regarding the Federal action by the Service and National Marine Fisheries Service of approving the request by Plum Creek to modify the HCP according to the results of the Land Exchange. The National Marine Fisheries Service is currently consulting on the effects of the HCP modification by the Services to Puget Sound chinook salmon (*Oncorhynchus tschawytscha*) and Mid-Columbia River steelhead trout (*O. mykiss*). This reinitiation is based upon the HCP Modification Document (Plum Creek 1999), the Final Supplemental Environmental Impact Statement (FSEIS)(USDI and USDC 1999a), and Section VII of the Record of Decision (USDI and USDC 1999b).

Watson, G. and S. Toth. 1995. Limiting factor analysis for salmonid fish stocks in the Plum Creek Cascades Habitat Conservation Plan (HCP) area. Plum Creek Timber Co., L.P., Tech. Rept. No. 14. Seattle, Washington. 58 pp.

Yahner, R.H. and D.P. Scott. 1988. Effects of forest fragmentation on depredation of artificial nests. J. Wildl. Manage. 52(1):158-161.

The Service has considered whether or not approving the HCP modification is likely to adversely affect the following federally listed threatened species: northern spotted owl (*Strix occidentalis caurina*)(owls), marbled murrelet (*Brachyramphus marmoratus marmoratus*)(murrelets), grizzly bear (*Ursus arctos = U. a. horribilis*), Columbia River distinct population segment of bull trout (*Salvelinus confluentus*), Puget Sound/Coastal distinct population segment of bull trout (*Salvelinus confluentus*), and bald eagle (*Haliaeetus leucocephalus*); a federally listed endangered species: gray wolf (*Canis lupus*)(wolf), and a previously federally listed endangered species: peregrine falcon (*Falco peregrinus*). The Service also considered whether or not the proposed action is likely to adversely affect a federally proposed species: Canada lynx (*Lynx canadensis*)(lynx). The Service believes that the proposed action may adversely affect the northern spotted owl and the marbled murrelet, and may affect designated critical habitat for the owl and murrelet. The Service has determined that the proposed action may affect, but is not likely to adversely affect, gray wolves, grizzly bears, bald eagles, peregrine falcons, or Columbia River bull trout for the following reasons:

Grizzly Bear: Within the North Cascades Grizzly Bear Recovery Zone (USFWS 1993; Almack 1993), the Forest Service will acquire substantial amounts of land from Plum Creek (about 18,800 to 30,800 acres)(Figure 1.). Note that ranges in numbers are explained in the Description of Proposed Action later in this document. Plum Creek may own very little land within the Grizzly Bear Recovery Zone following the exchange. Plum Creek ownership within the Recovery Zone would decrease by about 16,500 to 28,500 acres. They will acquire about 2,200 acres within the Recovery Zone, east of Lake Cle Elum and just north of the town of Ronald. This is a low-elevation area with little chance of attracting grizzly bears. Because of the proximity to towns, it is not likely the Service would manage for grizzly bears in this area.. It is within the Grizzly Bear Recovery Zone (e.g., I-90 Lakes Subunit of the Planning Area) that the establishment of resident grizzlies is most likely to occur. It is therefore expected that the probability of take occurring from Plum Creek actions under the HCP, which was already at a very low likelihood, would further decrease with the HCP modification. Also, there has been no change in the status of grizzly bears or understanding of grizzly bear biology and habitat relationships within the action area, and there is no information to indicate that this action will have a negative effect on grizzly bears.

Gray Wolves: The most likely areas for wolves to colonize within the HCP area would be within the Grizzly Bear Recovery Zone and within the upper Taneum Creek/Manastash area. The primary exchange action in these areas is for Plum Creek land to be exchanged to the Forest Service. Under the Modified HCP, Plum Creek would own about 30,000 fewer acres within the Yakima River subbasin. It was expected that the take of wolves was unlikely under the original HCP, but would likely be even less likely under the modified HCP. There has been no change in the status of gray wolves or understanding of gray wolf biology or habitat relationships within the action area, and there is no information to indicate that this action will have a negative effect on gray wolves.

Columbia River Bull Trout: The Forest Service will be acquiring lands surrounding known locations of bull trout within the Planning Area (streams feeding into Keechelus Lake,

Kachess Lake, and Lake Cle Elum. Plum Creek will acquire about 2,200 acres north of Ronald and approximately 2,000 acres near Gnat Flat and along the North Fork of the Manastash Creek. These areas contain few streams and even fewer fishbearing streams. It is not likely that bull trout are spawning or rearing in the areas north of Ronald. Plum Creek may acquire a little over a mile of Dingbat Creek, and slightly more than a mile of creek in Davis, Bear, and Newport Creeks combined. The drainage basins are not considered to be large enough to contain bull trout nor are the streams considered to be high enough in elevation to support bull trout spawning and rearing. These streams have been surveyed for presence or absence of fish, but not following bull trout protocols. No bull trout were detected during such surveys. With respect to the Manastash lands, most of these sections are upland habitat. The few creek miles are very high in the drainage and are unlikely to contain bull trout. The North Fork of the Manastash Creek is likely fishbearing. It has not been surveyed. The creek flows through meadows and forest. A Forest Service Road parallels the creek on the northeast bank. Areas to the south and west are regenerating from past clearcuts. Mature forest exists to the north and east of the road. Pathways for delivery of wood, sediment, and water are likely interrupted by the existing road. Management of mature forest would not likely have impact to the creek and therefore would likely not have adverse impacts to bull trout, even if they should be found there.

Additionally, following the land exchange, Plum Creek will own and manage fewer roads and will conduct less harvest east of the Cascade Crest, in areas which may have as-yet-undiscovered bull trout. Plum Creek will have a net decrease of about 23,700 to 41,400 acres in the Yakima River Basin. Plum Creek will own about 160 to 300 fewer stream miles in the Yakima River Basin, including about 19-34 fewer miles of fishbearing streams. There has been no change in the status of Columbia River bull trout or in the understanding of bull trout and their susceptibility to forest-management activities in the action area since July 1998 to warrant reinitiation at this time.

Bald Eagles: One nest site is know within the HCP Planning Area. The land owned by Plum Creek which is near this nest site would be transferred to the Forest Service. Plum Creek will be transferring lands along major rivers with potential for wintering foraging sites to the Forest Service and will not be acquiring such sites in the Land Exchange. Plum Creek's operations as agreed to in the HCP are not expected to result in take of bald eagles as evidenced by the fact that Plum Creek has not requested and the Fish and Wildlife Service has not placed bald eagles on the incidental take permit. The status of bald eagles has been generally improving across its range and delisting is being considered by the Service. There has been no change in status of eagles, or in understanding about their biology and effects of forest management, that would warrant reinitiation at this time.

Peregrine Falcons: The Forest Service is not transferring potential cliff-nesting habitat to Plum Creek. Plum Creek's operations as agreed to in the HCP are not expected to result in take of peregrines as evidenced by the fact that Plum Creek has not requested (and the Fish and Wildlife Service has not placed) peregrine falcons on the incidental take permit. The

Service has recently delisted the peregrine. The species has been delisted as announced in the August 25, 1999 Federal Register (64 FR 46542) . The original consultation on the Cascades HCP included peregrine falcons as it was completed prior to the delisting date. The protective measures described in that Biological Opinion remain in effect for the life of the Permit as the species remains covered by the HCP and the No Surprises policy applies.

Puget Sound/Coastal Bull Trout: Bull Trout are not known to occur upstream of the Howard Hanson Dam in the Green River basin, despite recent surveys. Combined with the protective measures of the HCP, which would minimize the probability of take as a result of 2,000 acres of increased Plum Creek ownership in the basin, the lack of change in miles of perennial streams, a net decrease of 3 miles of fishbearing streams, and the lack of presence indicates that it is not likely bull trout will be affected.

Canada Lynx: The Service has also determined that this action "is not likely to jeopardize the continued existence" of the Canada lynx. Should the Canada lynx become listed under the Act, implementation of the proposed action may have minor to no impacts on Canada lynx, and will be consulted upon at the time the Permit is modified to add this species.

This Biological Opinion on modification of the Plum Creek HCP utilized habitat definitions agreed to by Plum Creek and the Services as part of the HCP process. Another Fish and Wildlife Service Biological Opinion, addressing the Forest Service action of implementing the exchange and designation of acquired lands under the Northwest Forest Plan, utilized definitions of habitat in accordance with the biological assessment provided by the Forest Service. Both of these documents used their own definitions to develop estimates of impacts. Therefore, the numbers contained in these documents may appear to have slight discrepancies. However, the estimates should be relatively close to each other and the conclusions are the same.

BIOLOGICAL OPINION

Consultation History

Consultation was initiated on February 13, 1996. The initial Biological Opinion was based on information provided in the Multi-Species Habitat Conservation Plan on Forest lands owned by Plum Creek Timber Company, L.P., in the I-90 Corridor of the Central Cascades Mountain Range, Washington (Plum Creek 1996), the Final Environmental Impact Statement for the Proposed Issuance of a Permit to Allow Incidental Take of Threatened and Endangered Species: Plum Creek Timber Company, L.P., Lands in the I-90 Corridor, King and Kittitas Counties, Washington (USDI and USDC 1996a), the Implementation Agreement for the Plum Creek Timber Company, L.P., Multi-species Habitat Conservation Plan (Plum Creek et al. 1996), 13 technical papers prepared to support the HCP (see Appendix A), and various other documents cited in the 1996 Biological Opinion.

The Service also conducted an Unlisted Species Assessment: Analysis of effects on unlisted species from implementation of the Plum Creek I-90 HCP (USFWS 1996b). NMFS completed an analysis of the effects the HCP and IA would have on salmonid species under their jurisdiction (NMFS 1996), and that analysis was incorporated by reference into the June 24, 1996, Biological Opinion. The Services completed a Record of Decision (USDI and USDC 1996b) and a Statement of Findings (USFWS 1996c), which are incorporated herein by reference.

On June 27, 1996, the Service issued a Permit (PRT-808398) to Plum Creek Timber Company, L.P., pursuant to Section 10(a)(1)(B) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1532 et seq.). This Permit authorizes the incidental take of the threatened northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus marmoratus*), and grizzly bear (*Ursus arctos=U.a. horribilis*); and the endangered gray wolf (*Canis lupus*), in the course of the otherwise legal forest-management and related land-use activities in portions of King and Kittitas Counties, Washington. Pursuant to the HCP and the IA, Plum Creek received assurances that then-unlisted vertebrate species would be added to the Permit upon listing under the Act, if doing so were consistent with the IA. On July 13, 1998, the Service completed a Biological Opinion (USFWS 1998a) and Statement of Findings (USFWS 1998b) on the addition of Columbia River bull trout to the Permit. These documents are incorporated here by reference.

In August of 1995, the Forest Service and Plum Creek completed an "Agreement to Initiate" the Interstate-90 Land Exchange. The Service became involved through separate programs. The Service cooperates with the Forest Service in the implementation of the Northwest Forest Plan (USDA and USDI 1994a and b) and eventually initiated consultation under section 7 with the Forest Service as the action agency initiating the Interstate-90 Land Exchange.

The Service also cooperates with Plum Creek in the implementation of the HCP and initiated internal consultation under section 7 as the Service was requested to approve the HCP modification. The Interstate-90 Land Exchange Act of 1998 (Public Law 105-277)(Exchange Act) was approved by the United States Congress on October 21, 1998 (112 Stat. 2681; 16 USC 539K). The Exchange Act identified lands to be traded, defined which lands to drop and in what order they were to drop out of the trade as needed to equalize final trade values, and also created the Kelly Butte Special Management Area in the Green River watershed. The Exchange Act also directed the Forest Service to evaluate additions to the Alpine Lakes Wilderness Area.

On October 1, 1999, the Service reinitiated consultation based upon the Habitat Modification Document (Plum Creek 1999), the Final Supplemental Environmental Impact Statement (DOI and DOC 1999a), and Section VII of the Record of Decision (USDI and USDC 1999b). On November, 29, 1999, the U.S. Congress amended the Interstate-90 Land Exchange Act. The amendment altered the lands being exchanged. The Service adjusted it's ongoing analysis accordingly. These documents are also incorporated by reference. A complete administrative record of this consultation is on file at this office.

DESCRIPTION OF PROPOSED ACTION

Service Action

The Service proposes to modify the HCP as described in the HCP Modification Document (Plum Creek 1999). The modification includes adjustments to the land-base and other minor changes associated with the changing land-base.

The primary change resulting from the Interstate-90 Land Exchange is the new land-base to which the HCP will apply, and the new land-base to which the Northwest Forest Plan will apply. However, additional changes are being made to the HCP commitments as a result of and consistent with the new land-base. The HCP modification document addressed revisions in the baseline that have occurred since issuance of the Permit in 1996, and revisions to anticipated impacts as a result of the modified land-base and associated changes to the HCP. As the Interstate-90 Land Exchange unfolded, changes were made to address murrelets, and other concerns outside the HCP Planning Area. These changes included the Forest Service retaining lands within 2 west-side sections, and Plum Creek placing 8 east-side sections in escrow and 19 east-side sections in an option status. Therefore, this opinion analyzes a range of conditions associated with 2 scenarios: (1) The escrow and option lands are eventually transmitted to the Forest Service; and (2) The escrow and option lands are retained by Plum Creek. Exchange, escrow, and option lands are depicted on Figure 1 of the Record of Decision (USDI and USDC 1999b) and Figure 1 herein. The following section summarizes the actual change to the land-base and to the commitments of the HCP.

Table 1. **Covered land and other ownership in the HCP Planning Area resulting from the land exchange and the potential sale of the 8 sections of "escrow" lands and 19 sections of "option" lands.**

	Original HCP	Land Exchange	Escrow Sections	Option Sections
Plum Creek	170,500	148,300	143,600	130,000
Forest Service [1]	196,500	218,700	223,400	237,000
Other	45,300	45,300	45,300	45,300
Water	6,600	6,600	6,600	6,600
Total	418,900	418,900	418,900	418,900

[1] It is not certain that all of the 13,600 acres of option lands potentially leaving Plum Creek ownership would be owned by the Forest Service. Recreational/environmental groups are included in the option offer. For purposes of this document and analysis, it is assumed that these lands will be either managed under the standards and guidelines of the HCP, or they will be managed comparably to Forest Service management under the Northwest Forest Plan. In both cases, this includes active management where necessary to provide for the vertebrate species covered by the HCP. In the remainder of this document, the Service will use the term "Forest Service" when addressing outgoing lands in any of the above categories.

Land-base within the Planning Area

* 8,600 acres will be acquired by Plum Creek from the Forest Service.
* 30,800 to 49,000 acres will be acquired by the Forest Service from Plum Creek.
* 2,000 acres of increased ownership by Plum Creek in the Green River Basin.
* 22,300 to 40,000 acres of decreased ownership by Plum Creek in the Yakima Basin.
* 5,300 to 9,300-acre increase in Forest Service's Late-Successional Reserve lands.
* 700-acre decrease in Forest Service's Matrix lands.
* 17,500 to 31,700-acre increase in Forest Service's Adaptive Management Area
* 470-acre decrease in Forest Service's potential murrelet habitat.
* 5,400 to 10,100 acres of spotted owl nesting habitat acquired by the Forest Service.
* 6,200 to 10,000 acres for spotted owl foraging habitat acquired by the Forest Service.
* 16,500 to 28,500-acre increase in Forest Service lands within the Grizzly Bear Recovery Zone.

* Riparian Reserve land allocation occurs along streams, wetlands, and other water bodies within the other land allocations. However, the Forest Service will gain as much as 12,000 acres of Riparian Reserve.

* Increased miles of streams on Forest Service lands according to the information in Table 2. below:

Table 2. Miles of increase in Forest Service streams as a result of the Interstate-90 Land Exchange.

Stream Type[1]	Yakima River	Green River	Total
Fishbearing	19-34	3	22-37
Perennial Nonfishbearing	21-45	-3	18-42
Seasonal	94-154	1	95-155
Unknown	25-57	3	28-60
Total	159-290	4	163-294

[1] Fishbearing streams were estimated by using Washington State-designated Type 1-3 Streams; perennial nonfishbearing streams were estimated by Type 4 Streams; and seasonal streams were estimated by Type 5 streams. In practice, many of the Type 4 streams will be discovered to be fishbearing, and many Type 5 streams will be discovered to be perennial. Fish presence and whether a stream without fish is perennial are factors which determine buffer types under the HCP.

In addition, the Interstate-90 Land Exchange Act established the Kelly Butte Special Management Area of 5,616 acres south of the Green River, which will consist of 2,408 acres of land from Plum Creek, 2,448 acres of Matrix land, 434 acres of Late-Successional Reserve, and 326 acres of Administratively Withdrawn lands.

HCP Commitments: Plum Creek will make several changes to their actions as a result of the land exchange. These changes fall into several broad categories:

1. Habitat Projections/Commitments: Because the initial amounts of habitat categories (e.g., owl habitat and stand structural stages) will be different, projected amounts will also be different for subsequent decades, in spite of the similar management scenarios being applied through forest-management simulation.

2. Site-specific Adjustments: Where lands with existing harvest deferrals for owl or goshawk habitat will be exchanged to the Forest Service, those will no longer be Plum Creek deferrals. In other areas, Plum Creek would acquire lands and defer those lands from harvest in order to ameliorate impacts to owls and goshawks.

3. Survey and Monitoring Adjustments: Similarly, adjustments to survey and monitoring areas would be made since it is no longer practical for Plum Creek to monitor areas which will be exclusively Forest Service. Another adjustment would be made to accommodate the acquisition of potential murrelet habitat by Plum Creek which will require surveys. Adjustments were also made to the survey methods for murrelets.

Specifically, the HCP modification included the following changes to Plum Creek commitments:

NOTE: Ranges in values are used to display the difference with and without escrow/option lands being included under the HCP.

1. Habitat Projections/Commitments:

* Maintain 8-9 percent nesting habitat at year 10; 6-7 percent in years 20, 30, and 40; and 7-8 at year 50.

* Maintain 9-10, 7-9, 15-18, 26-28, and 32-34 percent of their ownership in foraging habitat at years 10, 20, 30, 40, and 50 respectively.

* Modify the commitment to amounts of Stand Structural Stages on Plum Creek ownership: (1) Across the landscape; (2) Within Riparian Habitat Areas; and (3) Surrounding rock and talus areas, as depicted in Table 30A of the Record of Decision (Two versions of the table are included; 1 with and 1 without escrow lands).

2. Site-Specific Adjustments:

* Decrease the number of nesting, roosting, and foraging habitat (NRF) harvest deferrals for northern spotted owls. The modified HCP will have NRF deferrals supporting between 9 and 13 owl sites containing 1,102 to 1,855 acres. See Figure 2.

* Decrease the number of foraging/dispersal (FD) corridors. The modified HCP will have FD harvest deferrals of between 1,267 to 2,287 acres. See Figure 2.

* Defer from harvest potential murrelet habitat on about 400 acres. See ROD Figure 1 for general location.

* Decrease the number of harvest deferrals for goshawks. The modified HCP will have harvest deferrals for between 2 and 4 sites, containing a total of between 101 to 262 acres, depending on the disposition of the escrow and option lands. See Figure 2.

3. Survey and Monitoring Adjustments:

* Apply a modified murrelet survey protocol which incorporates both ground observers and radar stations to a portion of the acquired lands.

* Remove owl demographic monitoring area from the I-90 Lakes subunit. Increase the size for other portions of the Planning Area. See HCP Modification Figure A.

* Designate response reaches for aquatic monitoring in Green River Basin that might have otherwise been designated in the Yakima River Basin; and make other appropriate adjustments to aquatic monitoring to improve the opportunity to learn from the aquatic-monitoring effort. The Service intends to do so in consultation with aquatic experts working for Native American Tribes in the affected area.

Minimization and Mitigation of Effects

Measures to be implemented by Plum Creek to minimize and mitigate effects on listed and unlisted vertebrate species are fully described in the HCP, as amended by the HCP Modification Document, and are herein incorporated by reference. The modified HCP remains a programmatic-style plan for Planning Area management. Individual management units are not scheduled for harvest at any particular time and individual road locations and management are not specified. The HCP focuses on timber management as the primary landscape influencing factor and the factor with the most influence on wildlife species. It also relies on adaptive management and flexibility in implementation.

Covered Area Location and Description

Plum Creek's covered lands within the HCP Planning Area is located both east and west of the Cascade Mountain Crest along the Interstate-90 (I-90) corridor in central Washington, between 60 to 100 miles east of Seattle. In selecting the geographical boundaries for implementation of the HCP (HCP Figure 1), Plum Creek considered the then-proposed Growth Management Act zoning in King and Kittitas Counties, the potential habitat of the species to be protected, and the anticipated future activities that might result in incidental take of the above mentioned species. Plum Creek's timberlands in the HCP Planning Area incorporate portions of 11 Townships on the western slopes of the Cascade range, and 19 Townships on the eastern slopes of the Cascade range (HCP Appendix 1) for a total of about 170,600 acres. The HCP Planning Area is further described in the original HCP (Plum Creek 1996) and associated NEPA documents (USDI and USDC 1995 and 1996a), and the biological opinions on the initial Permit issuance (USFWS 1996a) and addition of Columbia River bull trout to the Permit (USFWS 1998a).

As the I-90 Land Exchange unfolded, changes were made to address murrelets. These changes included the Forest Service retaining lands within 2 west-side sections, and Plum Creek placing 8 east-side sections in escrow. To address other concerns outside the HCP Planning Area, some

National Forest lands outside the Planning Area were deleted from the exchange. As a result, 19 east-side sections were no longer included in the exchange, but were offered to be held as an "option" for future purchase. Therefore, this opinion analyzes a range of conditions associated with 2 scenarios: (1) The escrow and option lands are eventually transmitted to the Forest Service; and (2) The escrow and option lands are retained by Plum Creek. A map of the exchange, escrow, and option lands are depicted on Figure 1 of the Record of Decision (USDI and USDC 1999b), and Figure 1 herein. Therefore, the action being analyzed includes an estimation of take and impacts resulting from about 8,600 acres of land going to Plum Creek from the Forest Service in the context of 30,800 to 49,000 acres of land going from Plum Creek to the Forest Service. The analysis covers the range of conditions spanned by this action.

Covered Activities

The Permit only authorizes incidental take in connection with those aspects of commercial forest management considered in the HCP. These activities include timber harvest (cutting, felling, experimental silviculture, limbing, yarding and yarding corridors, construction and use of landings, loading and hauling); road construction, maintenance, decommissioning, and administrative and commercial road use; road access; site preparation including slash and residual treatment; firewood cutting; planting; fertilizing; pest and brush control; fire and erosion control; thinning and pruning; administration and monitoring; surveying, conducting stand examinations and inventory, and cruising timber; painting or marking of timber or stand boundaries; entry by silviculturalists, wildlife biologists, foresters, management, enforcement, and other personnel for miscellaneous activities such as assessments, land surveys, and general reconnaissance; and all other activities related to the conduct of the timber-management program and required actions of the HCP (e.g., research). Also included are administration and commercial use of gravel pits and rock quarries necessary for forest management; and administration and maintenance of all existing buildings, radio towers, and associated telecommunication facilities; and ecosystem-based forest planning on 169,177 acres of its ownership and about 1,400 of land for which Plum Creek retained timber-harvest rights in the I-90 corridor of the central Cascades Mountain Range in Washington.

Summary of HCP Actions

The HCP includes commitments to provide certain amounts and types of habitats and stand structural classes. Timber harvest and road construction must be consistent with maintaining those habitat levels. In general, the HCP does not make silvicultural prescriptions outside of some minimal leave-tree requirements and a few situation-specific standards and guidelines pertaining to special habitats, such as strict limitations to activities within the riparian zones. It is a programmatic-style plan. No predictions of the number of acres to be treated per decade are made in the HCP because the HCP does not limit the amount of timber harvest in uplands so long as the required conditions are met.

Individual management units are not scheduled for harvest at any particular time and individual road locations and management are not specified. The HCP focuses on timber management as the

primary landscape-influencing factor and the factor with the most influence on listed wildlife species. As long as Plum Creek's activities are consistent with the HCP, the Permit provides a mechanism to authorize incidental take of listed species under Section 10 of the Act. In addition, under the HCP, Plum Creek is required to comply with Washington State Forest Practices Rules and Regulations (WFPB 1998), as amended, throughout the Permit Period. While WAC 222-16-080-7(a) exempts activities covered under an HCP from the provisions of WAC 222-16-080, State rules and regulations such as road-construction standards and minimal leave-tree requirements are not intended to be supplanted as a result of implementation of the HCP. These are the major actions which occur under the HCP. Other actions, such as road-building for access, are conducted in support of timber harvest and management.

Covered Species

The HCP considered, and some provisions of the IA address, all vertebrate species which may use the habitats which are present within the HCP Planning Area. These vertebrate species include not only the 285 known vertebrate species inhabiting the area which were specifically named and addressed in the HCP and its supporting technical papers, but additional species as well. Over 300 species were named specifically in either the HCP supporting documents or in the Service's unlisted species assessment (USFWS 1996c) and linked by guild to specific habitat types. The listed species which are covered by the current Permit include the northern spotted owl, marbled murrelet, gray wolf, grizzly bear, and Columbia River bull trout.

Marbled Murrelet

STATUS OF THE SPECIES (rangewide and/or recovery unit)

The status of the marbled murrelet was addressed in the 1996 Biological Opinion (USFWS 1996a) and later in the Biological Opinion for the Washington State Department of Natural Resources HCP (USFWS 1997). Additional information has become available since that time. For instance, since completion of the WDNR HCP, a consultation was conducted with respect to murrelets and the Bureau of Indian Affairs activities on the Quinault Indian Nation (USFWS 1998) which is herein incorporated by reference. The following description incorporates the most-recent information available at this time.

The size of the listed population of the murrelet in Washington, Oregon, and California has been estimated at 18,550 - 32,000 (Ralph et al. 1995b). The large range in the population estimate is a result of two widely divergent population estimates in Oregon. In Washington, Speich and Wahl (1995) concluded that murrelet populations in Puget Sound are lower now than they were at the beginning of this century. The estimate for Washington, which was made in the early 1980s, is about 5,500 murrelets (Speich and Wahl 1995). Varoujean and Williams (1994) estimated that 1,720 birds occur on the outer coast of Washington and the western portion of the Strait of Juan de Fuca.

Productivity estimates range from 3 percent juveniles in the California population (Ralph and Long 1995) to 8 percent in the Puget Sound population in Washington (Stein and Nysewander 1996), indicating low productivity. Using these juvenile: adult ratios, Beissinger and Nur (1997) constructed a demographic model to evaluate murrelet population trends and concluded that the population may be declining at rates of 2 to 12 percent per year. It is possible, however, that the age-ratio data used in the model are reflective of unusually adverse ocean conditions (Ralph et al. 1995b).

Ralph et al. (1995b) summarized some of the reasons for variability in population estimates among researchers, including differences in methodology, assumptions, spatial coverage, and survey and model errors. Nevertheless, Ralph et al. (1995b) and the Marbled Murrelet Recovery Team (USDI 1997) have concluded that the listed population appears to be in a long-term downward trend. The Recovery Team estimates that the population may be declining at rates of between 4 to 12 percent, which means that in 20 years the population could be less than one-half to one-twelfth its current size.

The loss of nesting habitat (older forest) has generally been identified as the primary cause of the murrelet's population decline and disappearance across portions of its range (Ralph et al. 1995; USDI 1997). Other factors of secondary importance which have been identified are high nest predation rates, mortality in gillnets, and oil spill mortality.

Murrelet nesting habitat is dependent upon old-growth forests and forests with an older tree component (Hamer and Nelson 1995; Ralph et al. 1995b). Sites occupied by murrelets tend to have a higher proportion of mature forest classes than do non-occupied sites (Raphael et al. 1995b). Much of this habitat has been lost due to timber harvest over the last century (Booth 1991; Bolsinger and Wadell 1993; Ripple 1994; Perry 1995). Based on Teensma et al. (1991) and other sources, Ripple (1994) concluded that the amount of old-growth forest lands in the Oregon Coast Range was 43 percent in 1933 and 61 percent before the 1840s. This determination is consistent with Booth's (1991) conclusion that 82 to 87 percent of the old-growth forests that existed in western Washington and Oregon prior to the 1840s is now gone.

Perry (1995) estimated about a maximum of 2,362,469 acres of potentially suitable murrelet habitat remains. Washington has approximately 977,811 acres; Oregon has about 565,185 acres; and California has an estimated 819,472 acres. Perry (1995) provided two caveats regarding the interpretation of these data. First, estimates are largely based upon interpretations of satellite imagery and have not been thoroughly ground-truthed. Second, the estimates refer to quantity of potential habitat, not quality. Whether a stand actually provides quality murrelet habitat depends on proximity to the coast, landscape context, and stand size. He defined quality habitat as that which meets basic nesting requirements, provides refuge from predators, and is relatively stable against catastrophic disturbances. Perry (1995) concluded that it is not possible at this time to estimate the proportion of remaining habitat that could be considered of high enough quality to allow long-term nesting success.

The Marbled Murrelet Recovery Plan (USDI 1997) outlines the conservation strategy for the recovery of murrelets. The conservation strategy recognized that the Northwest Forest Plan provided the backbone for the recovery of murrelets. The Recovery Team identified six Marbled Murrelet Conservation Zones throughout the listed range of the species. These are the Puget Sound Conservation Zone (Zone 1)(Puget Zone); the Western Washington Coast Range Conservation Zone (Zone 2); the Oregon Coast Range Conservation Zone (Zone 3); the Siskiyou Coast Range Conservation Zone (Zone 4); the Mendocino Conservation Zone (Zone 5); and the Santa Cruz Mountains Conservation Zone (Zone 6).

Under the Northwest Forest Plan, the Forest Service and Bureau of Land Management adopted a plan for their lands that provides a long-term management strategy for murrelets (USDA and USDI 1994a and b). The Northwest Forest Plan mandates the protection of all sites determined to be occupied by murrelets, including those found outside mapped Late-Successional Reserves. In the short-term, all known occupied sites of murrelets occurring on Federal lands are to be managed as Late-Successional Reserves. In the long-term, unsuitable or marginally suitable habitat occurring in Late-Successional Reserves will be managed, overall, to develop late-successional forest conditions, thereby providing a larger long-term habitat base into which murrelets may eventually expand. Thus, the Northwest Forest Plan approach offers both long-term and short-term benefits to the murrelet. It is anticipated that implementation of the Northwest Forest Plan will result in an 80 to 90 percent likelihood of achieving a murrelet population well-distributed across Federal lands.

The range-wide status of the murrelet has been affected by a number of Habitat Conservation Plans (HCPs) that were prepared in conjunction with incidental take permit applications to the Service pursuant to section 10(a)(1)(B) of the Act. A number of HCPs have been completed within the range of the murrelet in California, Oregon, and Washington. Under the Pacific Lumber Company HCP in California, the incidental take of murrelets associated with 4,696 acres of lower quality, occupied habitat was anticipated. Three Oregon HCPs cover 302,106 acres and allow incidental take of murrelets associated with 2,440 acres of low-quality nesting habitat.

In Washington, four HCPs addressed murrelets. Not including the Washington Department of Natural Resources (WDNR) HCP (WDNR 1997) discussed below, the HCPs cover approximately 230,190 acres of nonfederal lands and allow for the incidental take of murrelets associated with 2,810 acres of low-quality nesting habitat, of which 1,410 acres are located west of the Cascade Crest.

Murray Pacific Corporation completed a 100-year HCP (Murray-Pacific 1995) for their 53,527-acre Mineral Tree Farm in Lewis County, Washington. Although no marbled murrelet occupancy has been determined by current surveys, the amended Permit allows incidental take of murrelets associated with 800 acres out of 1,091 acres of potential murrelet habitat. If murrelets occupy potential habitats in the future, some incidental take may occur as a result of disturbance.

The original Plum Creek Cascades HCP (Plum Creek 1996) addressed about 170,600 acres for 50-100 years in King and Kittitas Counties, Washington. The Permit allows incidental take of murrelets

associated with up to 400 acres of unsurveyed low-quality habitat west of the Cascade Crest and 1,400 acres of unsurveyed land east of the Crest. The HCP addressed protection of occupied stands and seasonal protection from disturbance.

Port Blakely Tree Farms completed a 50-year HCP (Port Blakely 1996) for 7,486 acres in Grays Harbor County, Washington. No modification nor disturbance of known occupied murrelet sites is authorised under the HCP; however, due to the possibility that habitat surveyed in the first 5 years of the plan could eventually become occupied in the future, incidental take may result from harvest of 210 acres of deferred habitat and 250 acres of habitat that may develop in Riparian Management Zones. In addition, incidental take from disturbance due to harvest may occur during the nesting season.

The HCP of greatest significance is the WDNR HCP (WDNR 1997) which addressed about 1.8 million acres of State-managed lands throughout the range of the northern spotted owl including about 1.3 million acres west of the Cascade Crest. The WDNR HCP permits the incidental take of all murrelets associated with the harvest of up to 74,286 acres of unsurveyed, low-quality murrelet habitat in western Washington. The habitat released for timber harvest will be identified based on the results of a habitat relationship study that determines which habitat is most likely to be unoccupied, and the amount of habitat released will contain no more than 5 percent of the anticipated occupied sites on WDNR lands, based on the WDNR definition of suitable habitat. The remaining high-quality habitat will be surveyed for murrelets and all occupied sites will be protected from harvest. All surveyed unoccupied habitat in Southwestern Washington, any unoccupied habitat within 0.5 mile of occupied sites, and 50 percent of the unoccupied surveyed habitat in each Watershed Administrative Unit will be retained until the long-term plan is developed. Up to an estimated 52,000 acres of surveyed, unoccupied habitat will be released for harvest. Disturbance-related take due to timber harvest may occur on an average of 23,500 acres per year, and on 338 acres per year due to non-timber resource activities.

Status of Critical Habitat for the Marbled Murrelet

The term "critical habitat", as defined in the Act, is "(i) the specific areas within the geographic area occupied by a species...on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it was listed...upon a determination...that such areas are essential for the conservation of the species ((16 U.S.C. 1532 (5)(A))." Critical habitat was designated for the marbled murrelet on May 24, 1996, (61 FR 26225)(USFWS 1996d) and is depicted in Figure 2 of the Service's 1996 Biological Opinion. A more complete description and background on critical habitat is found in the Final Rule designating critical habitat for the marbled murrelet, and in the Biological Opinion for Plum Creek's Cascades HCP (USFWS 1996a). Those documents are hereby incorporated by reference.

ENVIRONMENTAL BASELINE (in the action area)

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation in progress. Such actions include, but are not limited to, previous timber harvests and other land-management activities.

For the purposes of this consultation, the Service has identified the action area for the murrelet to be the terrestrial portion of its range in the Puget Sound Conservation Zone (Puget Zone) (USDI 1997). Approximately half of the state-wide population occurs in this Zone. Forest lands in the Puget Zone closer to the marine environment are privately owned and have largely been harvested in the last century. Very little high-quality murrelet habitat occurs on nonfederal lands. State and Federal forest lands in the Puget Zone are more distant from marine waters. An estimated 1,081,190 acres of potentially suitable habitat is present in the Puget Zone, based on late-seral forest data. The main threat to the species in the terrestrial portion of its range is continued loss of suitable nesting habitat. Other threats are oil spills, fisheries gill-net mortality, and reduced food supplies due to changes in the marine environment. The southern portion of this zone, where the proposed action takes place, is characterized by limited habitat availability and low numbers of murrelets.

The quality of murrelet habitat occurring on nonfederal (State, County, City, Tribal, and private) lands in Washington ranges from non-habitat (e.g., plantations) to high-quality habitat (i.e., large blocks of old-growth forest). Much of the habitat on these nonfederal lands is of lesser quality due to its occurrence in smaller, more-fragmented blocks. However, approximately 45 percent of the known occupied murrelet sites, and approximately 25 percent of the suitable murrelet habitat in the State, occur on nonfederal lands. Only a small percentage of suitable murrelet habitat on Federal and nonfederal lands has been surveyed to determine occupancy. More areas have been surveyed to determine presence or absence, but this number is also small. The amount of nonfederal lands surveyed will increase as Washington State Forest Practices Rules and Regulations require private landowners to survey higher-quality suitable murrelet habitat prior to harvest.

Murrelets on private lands within the action area have been affected by several HCPs. The general strategy to date has been to survey high-quality habitat, protect known occupied sites, and release low-quality habitat for harvest without requiring surveys. It is expected that this approach will maintain the distribution of murrelets in the short-term. It is not expected that management of upland forests on nonfederal lands will result in the development of much high-quality murrelet habitat.

The Northwest Forest Plan addresses the loss of late-successional forest on Federal lands and promotes the recovery of species dependant on late-successional forest. Approximately 90 percent of the suitable murrelet habitat on Federal lands is protected and there is a total prohibition on the harvest of occupied murrelet habitat on lands addressed by the Northwest Forest Plan.

The Green River/Snoqualmie Pass area of the land exchange has been heavily harvested on both Federal and nonfederal lands. Wide-spread fire in the early part of this century resulted in what today is forest of less than 100 years old within only isolated patches of old growth. Most remaining murrelet habitat is fragmented, found associated with riparian areas or other depressions where it escaped fire, and largely limited to National Forest lands in a checkerboard ownership pattern. Where checkerboard ownership is present, the development of significant amounts of contiguous habitat beyond a square mile is highly unlikely. The integrity of existing stands may continue to be compromised by edge effects and potential right-of-way projects. Suitable habitat in larger blocks generally is present on Federal lands to the north and south of the exchange area.

Murrelet surveys have been conducted at numerous sites throughout the portion of the project area in the Green River. Prior to 1999, out of 434 survey stations (Washington Department of Fish and Wildlife database) that encompass the I-90 exchange area and adjacent National Forest lands , single detections were recorded on the lower Green River. Another potential observation was reported at Gold Creek, just east of the Cascade Crest. Most of the surveys in the action area were conducted in conjunction with proposed activities such as timber harvest and road building. A significant amount of the habitat in the action area has been surveyed. Previous survey efforts in the HCP Planning Area were summarized by Herter and Hicks (1995a).

Radar surveys were also conducted in the Green River watershed by Plum Creek to help evaluate the potential for murrelet occupancy within the watershed (Hamer 1998). Six sites were monitored with radar. They were strategically located several miles downstream from the most significant blocks of suitable habitat with the objectives of detecting any murrelets flying up the valley. Monitoring was conducted on ten mornings from June 7 to June 27, 1998. Although several murrelet-type radar targets were detected that fell within the flying speed of murrelets, consistent inbound and outbound patterns typical of murrelets were not seen. Hamer's conclusion was that there was, at most, one pair of murrelets using the watershed during that time.

In 1999, however, surveys were initiated by Plum Creek on several parcels of Forest Service lands, with significant amounts of suitable habitat, which were under consideration for exchange. Stands within two of these sections were found to be occupied, the first occupied stands found in the Green River watershed (Cooper et al. 1999). These sections were dropped from the exchange. Surveys will continue in the remaining stands in Year 2000. The relative paucity of inland detections is not surprising considering the small numbers of murrelets present in Puget Sound south of Seattle, the likely foraging area for murrelets nesting in the exchange area.

Stands of murrelet habitat are defined by potential for suitable platforms and continue until a 100-meter break in habitat is encountered. For purposes of landscape-level analysis on this action, the Service estimated potential habitat by Old Growth and Managed Old Growth structural stages in stands of more than 5 acres, more than 50 percent basal area in species other than Pacific Silver fir (*Abies amabilis*), noble fir (*A. procera*), subalpine fir (*A. lasiocarpa*), and mountain hemlock (*Tsuga mertensiana*), and west of the Cascades Crest. However, the Service and Plum Creek did not use those estimates alone to determine which lands would require survey; but instead, relied on aerial

photography, stand-level platform counts, and site-visits. For instance, in Sections 6 and 7, about 200 to 300 acres would be classified as Old Growth/Managed Old Growth, but the Service believed only 100 acres were suitable habitat and warranted surveys. Habitat on the east-side was estimated as Old Growth and Managed Old Growth structural stages within the Douglas-fir (*Pseudotsuga menziesii*)/ grand fir *(Abies grandis)* forest zone.

Critical Habitat

Within the HCP Planning Area, Critical Habitat Units (CHUs) were designated solely on Federal Late-successional Reserves (Figure 2 of the 1996 Biological Opinion). Two murrelet CHUs occur within the Planning Area and will be affected by the land exchange. CHU 10 is a 144,255 acre unit extending north from the Green River watershed. CHU 11 consists of 172,276 acres extending south from the Green River watershed. Approximately a quarter of these units are currently suitable murrelet habitat. The designation of critical habitat is still a legal instrument on the landscape, even following a land exchange, as there will continue to be required review under section 7 of the Endangered Species Act.

EFFECTS OF THE ACTION

Introduction

Considerable evidence links the declining numbers of murrelets to the removal and degradation of available suitable nesting habitat (Ralph et al. 1995a). The harvest of unsurveyed suitable habitat, which may be occupied, or unoccupied suitable habitat, can cause the decline of murrelet populations in several ways. These include:

1. Direct individual mortality or disruption of essential breeding and sheltering behaviors if harvest occurs during the nesting season;
2. The displacement of birds from traditional nesting areas;
3. The concentration of displaced birds into smaller, fragmented areas of suitable nesting habitat that may already be occupied;
4. Increased competition for suitable nest sites;
5. Decreased potential for survival of remaining murrelets and offspring due to increased predation;
6. Diminished reproductive success for nesting pairs; and,
7. Reduction of future nesting opportunities.

The direct loss of habitat has been the most significant cause of the decline of murrelet populations. Remaining habitat is highly fragmented and nest predation appears to be a significant factor impacting current populations. Murrelets have few natural defenses from predation and the ability to remain concealed is essential for successful reproduction. Fragmentation of habitat results in increases in forest edges and the displacement of murrelets to already occupied habitat. The increased murrelet densities and exposure to edges in remnant nesting habitat may make birds more

susceptible to predation. Predation by corvids and raptors is a known cause of murrelet nest failure. From 1974 through 1993, 67 percent of all known murrelet nests in the Pacific Northwest failed due to predation. Successful nests were also significantly further from edges (Nelson and Hamer 1995). Corvid predation on the nests of small birds is known to increase with increased forest fragmentation or decreased distance of nests from a forest edge (Gates and Gysel 1978; Andren et al. 1985; Small and Hunter 1988; Yahner and Scott 1988).

Surveys and Protection

Suitable habitat with a high or moderate likelihood of containing murrelets will be surveyed by Plum Creek prior to any harvest activities as stipulated under their existing HCP. However, the survey methodology to be used on exchange lands will be changed from the original methodology according to the modified HCP. In Section 30 (T20N, R10E), the survey protocol incorporates elements of the Pacific Seabird Group protocol (Ralph et al. 1994, and subsequent amendments), that provides coverage of approximately 50 percent of the best habitat with ground-based observers, which is supplemented by radar. Radar provides coverage of areas that are difficult to survey with ground-based observers, and additional coverage of areas which have observers. It also has a higher probability of detecting murrelets where detection rates are very low. However, radar is not appropriate for establishing occupancy. The survey design was developed in consultation with the Service and Washington Department of Fish and Wildlife. Section 30 contains about 300 acres of suitable habitat, generally arranged around the drainage pattern. In Sections 6 and 7 (T20N, R11E), approximately 100 acres of suitable habitat are also being surveyed with a conventional Pacific Seabird Group protocol. A limited amount of potentially suitable habitat acquired by Plum Creek in the land exchange will not be surveyed. This habitat is less likely to be occupied because of either small stand size or the lower quality of habitat. Additional considerations included that most habitat would be protected in a Riparian Habitat Area (100 or 200 foot buffer measured horizontally) under the HCP, and/or because previous surveys in the vicinity did not detect murrelets. Therefore, there is a low probability of occupied habitat being available for harvest given the overall low likelihood of occupancy in the area and that most suitable habitat will be surveyed.

Any stand that is found to be occupied will be protected under the provisions of the Cascades HCP. Additionally, sites discovered on or adjacent to Plum Creek lands in the future, as well as those recently discovered on National Forest lands, will receive the protection of seasonal restrictions from timber harvest and road construction.

Effects

The most significant effects of the proposed action to murrelets are the loss through timber harvest of several hundred acres of suitable habitat, in areas determined to be unoccupied. Other negative effects include the potential degradation of sites found to be occupied (as a result of harvest adjacent to the stands); harvest of lands that are currently mature forest and would have developed into habitat; and, even though it is unlikely, the potential loss of unsurveyed, occupied sites in areas considered to have a low potential for occupancy. Positive effects include the long-term

development of a block of suitable habitat in Kelly Butte Special Management Area; and the protection from harvest of additional suitable habitat east of the Cascades.

East-side lands. An estimated 2,063 to 2,979 acres of potentially suitable murrelet habitat and 6,127 to 9,942 acres of mature forest, which could develop into suitable habitat, are present on Plum Creek lands going to the Forest Service. Approximately 1,071 acres of Old Growth/Managed Old Growth and 1,477 acres of Mature Forest structural stages within the Douglas-fir/grand fir Forest Zone on National Forest lands east of the Cascade Crest is being transferred to Plum Creek. However, none of the lands being transferred to Plum Creek are within the radius commonly used by the Service to predict murrelet occurrence (about 55 miles from marine waters).

West-side lands. Of the 721 acres of suitable habitat and 1,741 acres of mature forest going to Plum Creek, the largest portion of suitable habitat is located in Section 30 (T20N, R10E), with the remainder in small stands scattered throughout the exchange parcels. On Plum Creek lands going to the Forest Service, there are about 21 acres of suitable murrelet habitat and 520 acres of mature forest. The legislated exchange created the Kelly Butte Special Management Area south of the Green River. It forms a block of about 5,600 acres of Federal land by combining about 2,408 acres of land previously owned by Plum Creek and re-designating about 2,448 acres of Matrix, 434 acres Late-Successional Reserve, and 326 acres of Administratively Withdrawn lands. In matrix, suitable murrelet habitat which is found to be unoccupied can be harvested, while changing the designation to congressionally withdrawn will preclude harvest, even if habitat is unoccupied.

To assess the relative impacts and benefits of the exchange, the Service analyzed the exchange of suitable habitat and potential future habitat by geographic portions of the HCP Planning Area (Figure 3.). In the North West portion of the HCP Planning Area, the Forest Service will gain 21 acres of suitable habitat and 89 acres of mature forest, for a total of 110 acres in increased suitable and potential future murrelet habitat. In the Central West portion, Plum creek will gain 309 acres of suitable habitat and 1,078 acres of mature forest, for a total of 1,388 acres. In the South West portion. Plum Creek will gain 412 acres of suitable habitat and 663 acres of mature forest for a total 1,074 acres. However, also in the South West portion, the Forest Service will gain 431 acres of mature forest which will reduce the net increase of Plum Creek ownership to 643 acres of habitat in the South West portion of the Planning Area. As a whole on the west side, Plum Creek will acquire 2,462 acres of suitable and potential future habitat (mature forest and better), the Forest Service will acquire 541 acres, for a net increase in 1,921 acres of Plum Creek land in suitable and potential future habitat. Of the lands going to Plum Creek on the west side, 721 acres are suitable and of the lands going to the Forest Service, 21 acres are suitable habitat.

Should most or all of the suitable habitat exchanged to Plum Creek be found to be unoccupied, and subsequently harvested, it would be unavailable to the recovering murrelet population. Yet, it is unclear whether murrelets pioneer new sites well, given their high site-fidelity. However, if murrelets are found to be present in areas being surveyed, the proposed action would have less negative effects on the probability of the murrelet population to persist in the action area in the short term. Plum Creek would be required by the HCP to protect the occupied sites. Even so, existing

sites could be further impacted where the surrounding nonhabitat (which might currently buffer the occupied stand) is also exchanged to Plum Creek, but would not be protected from future harvest outside of the nesting season. This could potentially be the case only where potential habitat and non-habitat both occur in Section 30 (T20N, R10E), or where Section 7 (T20N, R11E) abuts Section 8 (T20N, R11E).

Harvest of contiguous adjacent mature forests, which may not currently be suitable marbled murrelet habitat, could increase edge effects in the remaining suitable habitat. However, south of the Green River, potential habitat in portions of Section 32 (T20N, R10E) is separated from the northwest corner of that Section by areas of mature forest which will remain in Federal ownership. The section to the northwest of Section 32 is Section 30 (T20N, R10E) which is proposed for exchange to Plum Creek. Harvest of Section 30 would not have edge effects to Section 32. Should murrelets be discovered in Section 30, the majority of that section would be designated as part of the occupied stand, although some non-habitat may occur in the northwest and southeast corners, and may be harvested producing edge effects to the habitat within Section 30. Sections 24 and 36 (T20N, R09E) appear to contain potential habitat, but such habitat is also separated from the habitat in Section 30 (T20N, R10E) by non-habitat within the northwest corner of Section 30 and southwest corner of Section 24; as well as by recent harvest units in Sections 19 (T20N, R10E), 25 (T20N, R09E), and 05 (T19N, R10E).

North of the Green River, Section 02 (T20N, R10E), which is proposed for exchange to Plum Creek, contains patches of fragmented forest with considerable edge surrounded by recent harvest units. Potential habitat in Sections 06 and 07 (T20N, R11E) is also separated from other habitat in Sections 12 (T20N, R10E), 08 (T20N, R11E), 32 (T21N, R11E), and 36 (T21N, R10E). Sections 6 and 7 (T20N, R11E) are generally surrounded by recent harvest units. Few adjacent stands have the potential to be impacted by harvests conducted within these sections. More specifically (beginning in the southwest and moving counterclockwise):

Section 12 (T20N, R10E) is bordered on the north and northeast by regenerating stands of younger forest. The northeast corner of Section 12 has natural openings with small fragments of mature forest in the extreme northeast corner. The adjacent portion of Section 7 (T20N, R11E) has a small area that is similarly composed of naturally fragmented mature forest with openings. Further to the east of this patch is more younger forest.

Section 8 (T20N, R11E) contains utility and transportation corridors, with the usual linear nonforested habitats, in the southeast portion of the Section. Conifer forest covers most of the remainder of the section, except for a recent triangular shaped harvest in the Northeast quarter of the northwest quarter. The far northwest corner and northern portion of the western edge is in mature forest and abuts similar forest conditions in the eastern portion of Section 7 (T20N, R11E).

Section 36 (T21N, R10E) has a pattern of talus and mature forest interlaced with considerable internal and external edge. The southeast corner is surrounded by recent harvest units.

Section 32 (T21N, R11E) has a band of mature forest generally running northwest and southeast through the section. However, there is regenerating younger forest in the southwest corner and on the lands surrounding the southwest corner.

Discussion

The distribution and numbers of murrelets and their relationship to existing habitat is poorly understood east of the Crest. Timber harvest east of the Crest differs in distribution and intensity from timber harvest west of the Crest; but, nonetheless, remaining murrelet habitat is fragmented. Although suitable murrelet habitat (as defined at the stand level) is present, murrelet use of habitat east of the Cascade Crest has limited documentation. It would be expected that east-side old-growth forests would be similar in structure to west-side habitats but not be as likely to be used by murrelets because of the distance from the marine environment and the change in climatic conditions. One reported observation of a murrelet made at Gold Creek in the Snoqualmie Pass area in 1993 is the only report of murrelet presence east of the Cascade Crest. Surveys have been much more limited on the east-side, with only three protocol surveys completed to date by the Forest Service. These have been in association with timber sales and campgrounds, and the best habitat has not been surveyed. In addition, the lands being acquired by Plum Creek are further than 55 miles from marine waters and are therefore outside the zone normally considered as possible nesting range.

On the west side, the land exchange does include an action which is expected to provide for more-favorable, long-term, recovery conditions. Creation of the Kelly Butte Special Management Area, which will be managed for late-successional forest, will create a large block of suitable habitat in the future (should site-specific soil and climatic conditions allow), which should provide better conditions in the future for successful murrelet nesting. Although little Old Growth occurs in this block, about 1,800 acres is mature forest. The transfer of Plum Creek lands with suitable habitat east of the Crest to the Forest Service could theoretically provide some marginal benefits to murrelets. However, because of elevation, distance to marine waters, and the unknown status of murrelets east of the Crest, the contributions of these lands towards murrelet recovery is uncertain.

The proposed action occurs in an area where Federal lands provide almost all of current, as well as future habitat for murrelets. The Service believes that these Federal lands, a significant portion of which are to be managed as Late-Successional Reserves or Adaptive Management Areas, would minimally meet most of the survival needs of the murrelet in the central and south Cascades in the near-term. However, the loss of suitable nesting habitat (as well as lands which would have developed into suitable nesting habitat in the near future) from the proposed land exchange could slightly hamper the potential recovery of the species in south Puget Sound in the near-term.

Summary of Effects

Effects of the proposed action to murrelets range-wide are expected to be relatively minor because the loss of occupied habitat or take of individual birds will be minimal at worst. Murrelet

populations in the area comprise a small proportion of the total number of murrelets in the Puget Zone, and few if any murrelets will likely be affected.

Critical Habitat Analysis

Concurrent with these effects are impacts to critical habitat. Critical habitat is considered "essential to the conservation of the species" and the Act defines conservation as the equivalent to recovery. Section 7 prohibitions apply to Federal actions that would impair survival and recovery of marbled murrelets or that would destroy of adversely modify designated critical habitat. When determining whether any particular action would appreciably diminish the value of a Critical Habitat Unit (CHU) for contributing towards the survival and recovery of murrelets, the Service must consider the expected role of the individual CHU, the baseline conditions of the CHU, and the interdependence of the CHU with other CHUs. However, Federal agencies are directed to evaluate impacts to critical habitat in relation to the full range of the subspecies.

The effect of the proposed land exchange on critical habitat is the transfer 1,111 acres of critical habitat, including 473 acres of suitable habitat and 190 acres of mature (or recruitment) habitat to Plum Creek. Because these lands being transferred to Plum Creek (including 663 acres of Critical Habitat Unit in mature forest or better) would no longer be in Federal ownership, most activities would not be subject to the provision of section 7 of the Act, or the protective management which Late-Successional Reserves have under the Northwest Forest Plan. Therefore, suitable habitat (with a high or moderate likelihood of use by murrelets) on these lands are being surveyed for murrelets as required by the HCP and if found to be unoccupied, they would become available for harvest. Harvest of these sections would adversely affect murrelet critical habitat by removing primary constituent elements, including suitable nesting trees. Mature Forest, which is not currently suitable habitat, but which would become suitable habitat, and which provides a buffer to suitable habitat, could also be harvested. This harvest and subsequent management, would then hinder the development of murrelet habitat on these CHUs.

Critical Habitat was not designated on nonfederal lands within the Green River basin; and, therefore, no Critical Habitat will be exchanged from Plum Creek to the Forest Service. Lands acquired by the Forest Service within or immediately adjacent to CHUs may be incorporated as CHUs by some future Federal action.

The portion of CHU 10 to be exchanged to Plum Creek (418 acres) only comprises 0.3 percent of the total acreage of the unit. This is a relatively insignificant amount of Critical Habitat. About 188 acres of the lands being acquired by Plum Creek are marginally suitable. Section 2 (T20N, R10E), within CHU 10, is proposed to be traded from public to private ownership. This section is not considered to currently contain suitable habitat. It is completely isolated from other patches of suitable habitat and is at the southernmost portion of CHU 10. Older forests present in this section are at higher elevations, consist primarily of silver fir (*Abies amabilis*) and noble fir (*Abies procera*)

and are only marginal habitat for murrelets. The isolated nature of this section, although managed as Late-Successional Reserve, precluded any significance for it in providing for the recovery of the murrelet.

The portion of CHU 11 which would be exchanged to Plum Creek (approximately 670 acres) comprises 0.4 percent of the total acreage of the unit. Of the lands being acquired by Plum Creek, 285 acres are considered potentially suitable and 190 acres are mature forest, for a total of 475 acres that are mature forest or better. Section 30 (T20N, R10E) is proposed for trade to Plum Creek. This section is at the northernmost point of CHU 11 and is arranged in a diagonal row on the landscape with sections which were found to be occupied in 1999. The mature and old-growth forest growing in this section is surrounded by early-seral forest resulting from timber harvests and is affected by the surrounding edge-effects. Nearby critical habitat to the south and east, which is not included in the exchange, is in a checkerboard ownership as well, and is comprised of suitable habitat mixed with harvested areas and high-elevation forest unsuitable for murrelets. Critical habitat in larger blocks is present further to the north (in CHU 10) and to the south. This section provides a relatively small amount of habitat at the northern end of the CHU, and it appears, based on the 1999 surveys, that murrelets may not be using this section. Murrelets are preferentially using the sections that were deleted from the exchange.

The Kelly Butte Special Management Area will function to maintain and restore a block of murrelet habitat that is consistent with the objectives of the portions of critical habitat being transferred to Plum Creek. The Kelly Butte Special Management Area will have a similar or higher level of protection than designated critical habitat. In the current landscape, Plum Creek and Forest Service matrix lands are available for harvest, and the Forest Service would be required to provide access across their lands to Plum Creek holdings, which would increase edge effects on National Forest lands. The proposed action would create a nearly contiguous block of 5,700 acres where contiguous forest would be protected and restored. According to Federal definitions of habitat, there are 480 acres of existing suitable habitat and 1,306 acres of mature or recruitment habitat within the designated Kelly Butte Special Management Area. This corresponds to an estimate of 1,800 acres of Mature Forest or better under HCP definitions.

By creating a block of habitat with large amounts of interior forest, nest predation on murrelets would be reduced. Edge effects would be minimized and the threat of edge effects would be removed with respect to critical habitat in Section 34 (T20N, R10E), which, in the absence of the Land Exchange, could occur with harvest on currently adjacent Plum Creek lands to the north and east. Section 35 (T20N, R10E) is contiguously forested. Section 27 (T20N, R10E) is recently harvested along the southern edge and southwest corner, west of the drainage, but has mature forest cover in the remainder of most of the section. There are also recent harvest units to the south of and on the southern portion of the western edge of Section 34. There is forested nonhabitat adjacent to the northern portion of the western edge. Edge effects such as windthrow would also be minimized by the formation of the Kelly Butte Special Management Area. Although less suitable habitat would

be available in the short-term, the Kelly Butte Special Management Area would likely provide more favorable conditions for nesting murrelets in the long-term than those in the CHUs being traded to Plum Creek.

Summary of Effects

The loss of suitable nesting habitat has been one of the primary causes for the decline of the marbled murrelet. Any further substantial reduction in occupied nesting habitat will affect the efforts to stabilize and recover the population (USDI 1997). The proposed land exchange will potentially result in the harvest of several hundred acres of suitable, unoccupied habitat and of several hundred acres of unsurveyed habitat with a low likelihood of occupancy because of marginal habitat quality, small stand size, and/or distance from marine waters. Suitable habitat would therefore be reduced, but the reduction in occupied nesting habitat would be minimized and is likely to be minor to nonexistent in scope. Occupied habitat could also be degraded by edge effects and disturbance.

Critical habitat would also be degraded, as habitat in units exchanged to Plum Creek will be harvested, should they be found to be unoccupied through the HCP-required surveys, and converted to commercial timber management. This will hinder future development of suitable habitat in the portions of the CHU in most of Plum Creek's ownership, although Old Growth and Managed Old Growth structural stages will develop in both the east and west sides of the HCP Planning Area. Reduction in the development of suitable habitat may result in an adverse effect to CHU's 10 and 11, but because of the peripheral location of these lands on the CHU and the relatively small area of the CHU which will be transferred, the proposed exchange will have a relatively minor impact on critical habitat. This impact could be further ameliorated should HCP-required surveys result in identification of occupied stands which would then be protected under the HCP.

The proposed action will also result in beneficial effects for marbled murrelets. One of the recovery objectives in the short term for the murrelet is to maintain potential and suitable habitat in larger contiguous blocks, while maintaining current north/south and east/west distribution of nesting habitat. In the long term, increasing the amount and quality of suitable nesting habitat by increasing the size of suitable stands to provide more interior forest is a high priority (USDI 1997). Establishment of the Kelly Butte Special Management Area fulfills both of these objectives, as well as providing for similar functions as those provided by the critical habitat which will be transferred to Plum Creek. With the land exchange, conditions for the murrelet would improve in the long term.

In summary, there will be some short-term adverse impacts to marbled murrelets, although these are judged to be relatively minor, since no higher-quality, occupied habitat will be harvested. The HCP-required surveys and protection will ensure protection of known occupied sites. In the long-term, conditions for marbled murrelets will improve and the potential for future degradation and loss of habitat on current Federal lands in the Kelly Butte Special Management Area will be reduced.

INTERRELATED / INTERDEPENDENT EFFECTS

Interrelated actions are part of the larger action and depend on the larger action for their justification. Interdependent actions are actions having no independent utility apart from the proposed Federal action. Regulations implementing section 7(a)(2) of the Act require the Service to consider the effects of activities that are interrelated or interdependent with the proposed Federal action (50 CFR §402.02). Both interrelated and interdependent activities are assessed by applying the "but-for test" which asks whether any action and its resulting impact would occur "but-for" the proposed action.

Interrelated and interdependent activities that may occur include timber-related activities and firewood cutting both of which may result in a small increase in the frequency of fire starts. An increase in fires could result in the loss of murrelet habitat on Federal lands or occupied stands on Plum Creek lands. Fire fighting may also result in disturbance to nesting murrelets. New road construction and increased traffic could disturb murrelets in remaining habitat when those sites are not known. The HCP does contain disturbance provisions which protect murrelets on both Plum Creek and other ownerships. As Plum Creek ownership on the west side of the crest is only increasing by 2,000 acres, additional road construction and firewood cutting is expected to be minimal. Additionally, much of the lands being acquired by Plum Creek do not lend themselves to high road densities as a result of steep slopes and high mass-wasting potential. Cable-yarding and other yarding methods (e.g., helicopter yarding) are expected to be used in many cases.

Perhaps the largest interdependent activity is the exchange itself. The action on which the Service is consulting in this document is modification of the HCP. The exchange itself was legislated by the U.S. Congress. Another section 7 analysis being completed by the Service and the National Marine Fisheries Service analyzes the effects of the exchange itself (both within and outside the HCP Planning Area) and re-designation of federally acquired lands, and is herein incorporated by reference.

The Alaska National Interest Lands Conservation Act (P. L. 96-487), approved December 2, 1980 (94 Stat. 2457; 16 U.S.C. 3210), directs the Secretary of Agriculture to provide access to nonfederally owned lands within the boundaries of the National Forest System. Plum Creek currently has numerous requests for road easements across National Forest lands within the HCP Planning Area. Most of these will be eliminated by the Land Exchange. See Northern Spotted Owls **INTERRELATED / INTERDEPENDENT EFFECTS** for additional details. Because the land exchange will consolidate ownership in the Green River, six of seven road access requests by Plum Creek will no longer be needed. This reduction in road easements within the Green River watershed will decrease forest fragmentation and related impacts of roads to wildlife and aquatic resources.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. The 1996 Biological Opinion, the 1996 FEIS, and the 1999 FSEIS addressed cumulative impacts and are herein incorporated by reference. However, future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Note: See Northern Spotted Owl, **CUMULATIVE EFFECTS**, later in this document.

CONCLUSION

After reviewing the current status of the marbled murrelet, the environmental baseline for the action area, the effects of the proposed HCP modification, and the cumulative effects, it is the Service's biological opinion that the HCP modification, as proposed, is not likely to jeopardize the continued existence of the murrelet, and is not likely to destroy or adversely modify designated critical habitat. This conclusion is based upon the minimal take of occupied habitat or individual birds as a result of harm, and because murrelet populations in this area comprise a small proportion of the total number of murrelets in the Puget Zone. With regard to critical habitat, the conclusion is based upon the fact that small amounts of habitat will be impacted in the short term and conditions will improve in the long term as a result of this action.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The proposed HCP modification and its associated documents clearly identify anticipated impacts to affected species likely to result from the proposed taking and the measures that are necessary and

appropriate to minimize those impacts. All conservation measures described in the proposed HCP modification, together with the terms and conditions described in the associated Implementation Agreement and section 10(a)(1)(B) permit issued with respect to the HCP, as modified, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within this Incidental Take Statement pursuant to 50 CFR §402.14(i). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(B) and section 7(o)(2) of the Act to apply. If the permittee fails to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(B) permit and section 7(o)(2) may lapse. The amount or extent of incidental take anticipated under the proposed HCP modification, associated reporting requirements, and provisions for disposition of dead or injured animals are as described in the HCP and its accompanying section 10(a)(1)(B) permit.

AMOUNT OR EXTENT OF TAKE

The Service anticipates that murrelets associated with up to 721 acres of low-quality suitable habitat or marginal habitat west of the Cascade Crest could be taken in the form of harm as a result of this proposed action. Also, some portion of 1,741 acres of nonhabitat (Mature Forest Structural Stage) west of the Cascade Crest, could eventually become habitat during the 100-year permit and subsequently subject to harvest without surveys. This could result in some future amount of take in the form of harm. However, about 400 acres of the 721 acres are being surveyed, which should greatly reduce the probability of take in the form of harm. The remaining acres are not likely to contain nesting murrelets. The incidental take is expected to be in the form of harm. Harm as a result of non-detection in surveyed stands subjected to subsequent harvest is estimated to be improbable, but possible. We also anticipate take associated with disturbance of unknown occupied sites which may establish in existing or future habitat within special management areas or their buffers under the HCP. Disturbance provisions will only protect known sites.

The Service has expressed the amount of take through harm in terms of occupied habitat which may be harvested. Incidental take of murrelets by harm or harassment will be difficult to detect as murrelets range widely and forage and winter on marine waters. Murrelets are also subject to nest predation which may be one of the indirect effects of timber harvest in surrounding areas which can create edge effects. Predation is difficult to quantify and makes take difficult to document. Predation is one of the reasons murrelets are so secretive and difficult to detect in general. Seasonal fluctuations in numbers could be a result of actions occurring in the marine environment. For these reasons, the Service used acres of habitat to define the amount of take.

The Fish and Wildlife Service will not refer the incidental take of any murrelet for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712) if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

NOTE: See Page ~53 for remainder of the Biological Opinion with respect to marbled murrelets.

NORTHERN SPOTTED OWL

STATUS OF THE SPECIES (rangewide and/or recovery unit)

Changes in the status of spotted owls which have occurred since the completion of the Biological Opinion for the Plum Creek Cascades Habitat Conservation Plan (USFWS 1996a) were described in the Biological Opinion for the Washington Department of Natural Resources Habitat Conservation Plan (USFWS 1997); and the Biological Opinion for the Bureau of Indian Affairs on the Yakama Indian Nation 1998 Timber Sale Program (USFWS 1998). The following description incorporates the most recent information available at this time.

Analysis of spotted owl demographics, based on data from 1985 to 1998, concluded the population is declining at an average rate of 3.9 percent per year (Franklin et. al., 1999). Earlier population trend analyses indicated that, range-wide, spotted owl populations were declining at an increasing rate of decline (Burnham et al. 1994). The review by Franklin et al. (1999) indicates a decreasing rate of decline and overall survival rates for female spotted owls in Washington State did not show a negative trend. The review by Franklin et al. (1999) was more comprehensive than Burnham et al. (1994) and included researchers from industry, Tribes, States, and Federal agencies in Washington, Oregon, and California.

The Spotted Owl Final Draft Recovery Plan (USDI 1992a) identified threats to spotted owl recovery and described the landscape context of their status. The final draft recovery plan and its relationship to the HCP Planning Area was analyzed in the 1996 Biological Opinion. Since that time, Washington State has promulgated a new set of Forest Practices Rules and Regulation with respect to the spotted owl (WFPB 1998). The State promulgated these regulation in anticipation that the Federal Government would be issuing similar regulations through a 4(d) Special Rule for the Northern Spotted Owl. The State regulations were designed to compliment the Northwest Forest Plan and were based on stated conservation functions in specific areas of nonfederal lands known as Spotted Owl Special Emphasis Areas (SOSEAs), and included the HCP Planning Area. The HCP Planning Area contains stated conservation functions for both dispersal and demographic support.

In Washington, five HCPs have addressed owls. Four of these addressed owls for private forest land managers in Washington: Murray Pacific Corporation Mineral Tree Farm; Scofield Corporation; Plum Creek Timber Company; and, Port Blakely L.P., R.B. Eddy Tree Farm. A fifth HCP addressing owls was completed for lands managed by the Washington Department of Natural Resources (WDNR). Not including the WDNR HCP (WDNR 1997), the HCPs cover approximately 231, 600 acres of nonfederal (private/corporate) lands and allow for the incidental take of owls associated with roughly 365 known or projected future sites over the next 100 years.

Murray-Pacific Corporation (now known as West Fork Corporation) completed a 100-year HCP (Murray-Pacific 1993) for their 53,527-acre Mineral Tree Farm in Lewis County, Washington. The original permit allowed the incidental take of up to 20 spotted owls due to habitat loss and

disturbance within 2.5 miles of 10 known site centers. In addition, since spotted owls might occupy marginal habitats, under the permit, 10 spotted owls may be incidentally taken in each succeeding decade until 2093.

The Scofield Corporation (USFWS 1996) permit authorized the incidental take of one pair of spotted owls as a result of a commercial-thinning harvest of a 40-acre parcel on the east side of the Cascades.

The original Plum Creek Cascades HCP (Plum Creek 1996) addressed about 170,600 acres (169,177 acres of Plum Creek ownership and about 1,400 acres of land for which Plum Creek reserved timber-harvest rights) for 50-100 years in King and Kittitas Counties, Washington. The Permit allows incidental take of up to 83 known or projected future owl sites over 100 years as a result of harm from habitat removal by timber harvest and a minimal amount of harassment from disturbance due to the seasonal restrictions on timber harvest and road construction.

Port Blakely Tree Farms completed a 50-year HCP (Port Blakely 1996) for 7,486 acres in Grays Harbor County, Washington. The HCP permits incidental take of three spotted owls in two site centers through harvest of about 2,750 acres of low quality spotted owl habitat. Spotted owls occupying forest habitats which may develop into suitable spotted owl habitats may also be incidentally taken during the permit period. A 70-acre core of habitat will be retained around known spotted owl site centers until 3 years of surveys determine that the site is no longer occupied. In addition, incidental take from disturbance due to harvest may occur during the nesting season.

The HCP of greatest significance is the WDNR HCP (WDNR 1997) which addressed about 1.8 million acres of State-managed lands throughout the range of the owl and including about 1.3 million acres west of the Cascade Crest. The WDNR HCP permits the incidental take of owls in three areas: Olympic Experimental State Forest; West-side Planning Units excluding the Experimental forest; and East-side Planning Units. In the Olympic Experimental Forest, the Service anticipated the incidental take in the form of harm or harassment of up to 31 pairs, young, and/or territorial singles in the near term (within the first 10 years). In the long term, the Service anticipates the incidental take in the form of harm or harassment of owls associated with the harvest of up to3,300 to 16,300 acres per decade. In the remainder of the West Side, the Service anticipates take in the form of harm or harassment of up to 70 known and 15 projected unknown pairs, young, and/or territorial singles in the short term, and 36 potential future sites in the long term. On the East Side, the Service anticipated the take in the form of harm or harassment of up to 47 known and 16 projected unknown pairs, young, and/or territorial singles in the short term, and 36 potential future sites in the long term. Disturbance-related take due to timber harvest may occur on an average of 26,675 acres per year for the first decade, and from nontimber resource activities on up to 1,060 acres per year.

Critical Habitat for the Northern Spotted Owl

The term "critical habitat", as defined in the Act, is "(i) the specific areas within the geographic area occupied by a species...on which are found those physical or biological features (I) essential to the

conservation of the species, and (II) which may require special management considerations or protection; and (ii) specific areas outside the geographical area occupied by a species at the time it was listed...upon a determination...that such areas are essential for the conservation of the species ((16 U.S.C. 1532 (5)(A))." Critical habitat was designated for the spotted owl on January 15, 1992 (effective February 14, 1992) (USFWS 1992b) and is depicted in Figure 1 of the Service's 1996 Biological Opinion. Critical Habitat Units (CHUs) were designated solely on Federal lands. A more complete description and background on critical habitat is found in the Final Rule designating critical habitat for the spotted owl (USFWS 1992b), and in the Biological Opinion for Plum Creek's Cascades HCP (USFWS 1996a). Those documents are hereby incorporated by reference.

Since designation of critical habitat for the spotted owl, the Northwest Forest Plan was developed to address the conservation and recovery of spotted owls and other species dependent upon late-successional forest (USDA and USDI 1994a and b). The Northwest Forest Plan provides for the protection of extensive forest reserves in Federal ownership which currently support, or have the potential to support, large, reproductively viable spotted owl population clusters. When the proposed elements of the Northwest Forest Plan were reviewed by the Service, it was determined that the standards and guidelines for the system of Late-Successional Reserves, in conjunction with other components of the Northwest Forest should enable the Northwest Forest Plan as a whole to perform the biological function for which critical habitat was designated. In general, Late-Successional Reserves protect larger blocks of land than the CHU network, allowing for the creation of more interior habitat than in the CHU system (USDA and USDI 1994a). Although CHUs are more evenly distributed across the landscape, the Northwest Forest Plan placed an emphasis on landscape connectivity between Late-Successional Reserves through the application of Riparian Reserves and matrix standards and guidelines. Including Administratively Withdrawn Areas and the projections for Riparian Reserves, the Northwest Forest Plan is expected to protect about 1 million more acres of currently suitable habitat than does the CHU network (USDA and USDI 1994a).

The Northwest Forest Plan addresses land exchanges involving Late-Successional Reserves by stating they will be considered if the exchange occurs: where public and private lands are intermingled; where they contribute to biodiversity; if they improve the area, distribution, connectivity, and shape of Late-Successional Reserves; and if Aquatic Conservation Strategy objectives are met. Under the Northwest Forest Plan, Late-Successional Reserves are designed to maintain functional, interacting, late-successional and old-growth forest ecosystems (USDA and USDI 1994b). However, designation of critical habitat is still a legal instrument on the landscape, even following a land exchange, as there will continue to be required review under section 7 of the Endangered Species Act.

ENVIRONMENTAL BASELINE (in the action area)

Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone section 7 consultation, and the impacts of State and

private actions which are contemporaneous with the consultation in progress. Such actions include, but are not limited to, previous timber harvests and other land-management activities.

Northern Spotted Owl

No spotted owl surveys were completed as part of this HCP modification or as part of the land exchange. Previous and ongoing survey data collected by the Forest Service's Pacific Northwest Research Station and Plum Creek have been compiled to provide information on numbers of owl circles. Results of the HCP's 1997 and 1998 Spotted Owl Demographic Monitoring (Herter et al. 1999) were incorporated into this analysis.

Since completion of the Plum Creek Cascades HCP, two new sites have been discovered in or adjacent to the HCP Planning Area. One of these, Kachess Ridge, will be protected by a deferral of habitat under the HCP modification. The other site, Rachel Lake, is more than 2 miles from Plum Creek ownership and the pair found there in 1997 was not relocated during surveys in 1998 and 1999. Three sites have been decertified: Cooper River, South Cle Elum ridge, and Charlie Creek. During the 1997 and 1998 demographic monitoring, all known existing sites were relocated, but no new sites were discovered (Herter et al. 1999).

All of the HCP area east of the Cascade Crest falls within two adjoining spotted owl demography study areas, both at least partially funded by the Forest Service. The portion of the HCP Planning Area within the Cle Elum ranger District makes up a large part of the Cle Elum Demography Study Area of the Forest Service's Pacific Northwest Research Station. That portion of the HCP area within the Naches Ranger District makes up a small part of the East Cascades Demography Study Area monitored by National Council for Air and Stream Improvement (NCASI). Portions of the west side of the HCP Planning Area are included in the more-recent Rainier Demography Area which includes a cooperative effort by Plum Creek and the National Park Service, and is coordinated by Raedeke Associates. Populations of spotted owls in the Cascade range can be placed into two groups based on geography and demographic variables. Owls on the west side of the Cascade Crest (and those just east of the Crest in the Douglas-fir/western hemlock forest class) appear to have lower productivity but higher longevity than their counterparts on the east side of the crest. Productivity of spotted owls, based on nesting data, from 1991 through 1994 is shown in Herter and Hicks (1995a). More-recent information is summarized in Table 3 of this document. Juvenile emigration rate estimates are not available for the Rainier Demography Area, and therefore lambda rates estimates for that area are a worst-case estimate.

Table 3. Spotted Owl Site Productivity in the Plum Creek Cascades HCP Area

Year/Area[1]	Active Sites[2]	#Nests	% Nesting	#Fledglings
1991-West	14	4	29%	4
- East	43	24	56%	34
-Total	57	28	49%	38
1992-West	18	12	67%	14
-East	45	38	84%	49
-Total	63	50	79%	63
1993-West	17	0	0%	0
-East	45	4	9%	4
-Total	62	4	6%	4
1994-West	20	9	45%	9
- East	42	32	76%	51
- Total	62	41	66%	60
1995- West	21	6	29%	5
- East	35	18	51%	22
- Total	56	24	43%	27
1996- West	20	13	65%	18
- East	31	25	81%	32
- Total	51	38	75%	50
1997-West	18	0	0%	0
- East	27	2	7%	2
- Total	45	2	4%	2
1998-West	16	15	94%	16
- East	28	23	82%	39
- Total	44	38	86%	55
1999-West	16	1	6%	0
- East	25	6	24%	6
- Total	41	7	17%	6

[1] West means west of the Cascade crest plus two sites within 1 mile of the crest (Cold Creek and Little Naches-North Fork); East means east of the Cascade crest minus the two sites mentioned above.

[2] Active sites are those sites which contained a single or pair of owls in the year of study

(Data provided by H. Stabins, Plum Creek Timber Company, December 1999)

Productivity of spotted owls in the Planning Area is comparable to neighboring study areas. HCP Table 6 provides standard productivity estimates (based on females) for spotted owls in the Planning Area. From 1991 through 1994, fecundity measurements were 0.430, 0.580, 0.039, and 0.547 female offspring per female owl. For most measures, productivity in the Planning Area is slightly lower than that of the adjacent portions of the USFS-PNW Cle Elum study area. This difference is due primarily to lower productivity of the west-side owls. If west-side and east-side owls are measured separately, productivity measures for east-side owls are very similar to the productivity measures reported in the USFS-PNW Cle Elum study area, and productivity measures exhibited by west-side owls is similar to the productivity measures reported in the USFS-PNW study for owls on the Olympic Peninsula. Of the 8 demographic study areas in the Burnham et al. 1994 meta-analysis, the Cle Elum area (in which the Planning Area partially lies) consistently showed higher productivity from 1989 to 1995. Estimates of juvenile survival rates on the Cle Elum and Olympic study areas were believed to be low due to emigration of dispersing juveniles from these areas (Burnham et al. 1994).

Lambda values were not calculated for the Planning Area because they would require additional tracking of juveniles to estimate juvenile emigration and survival. However, in the USFS-PNW Cle Elum study area, lambda estimates for 1989-1993 were not significantly different than 1.0 when adjusted for juvenile emigration (E. Forsman, U.S. Forest Service -- Pacific Northwest Research Station, pers. comm., 1996). The Lambda values increased from 0.924 (s.e. = 0.032) to 1.024 (s.e. = 0.058) when adjustments were made in juvenile survival rates, based on juvenile emigration rates from radio-telemetry studies. However, Forsman emphasized that the adjustments were based on a small sample size from only 2 years of data and may be subject to future modifications. Recent estimates of lambda indicate that it is not significantly different from 1.0, although the point estimate for the Cle Elum Study Area indicated a lambda of about 0.96. This implies a stable or nearly stable population. Lambda as an indicator of population trend in northern spotted owls is still sensitive to the number of good and poor production years within the sample. Spotted owl reproduction is highly variable from year-to-year, as seen in recent years (Table 3.).

Predation (most likely from larger raptors such as great horned owl, red-tailed hawk, and northern goshawk), starvation, disease, advanced age, and accidents are the most likely causes of death among adult and juvenile owls (Herter and Hicks 1995b; E. Forsman, U.S. Forest Service -- Pacific Northwest Research Station, pers. comm., 1996). Barred owls and goshawks are potential sources of mortality from predation. HCP Figure 18 shows barred and spotted owl sites in the Planning Area. There are almost as many barred owls in the Planning Area as there are spotted owls. There are also about 18 known goshawk sites within the Planning Area.

Annual spotted owl home ranges are relatively large and vary in size across the range of the subspecies. The median home range for owl pairs in the Washington Cascades is estimated at approximately 6,657 acres in size, with minimum and maximum ranges of 3,673 and 15,578 acres, respectively (Thomas et al. 1990). A median home range can be estimated by a 1.82-mile radius circle measured from the activity center. As habitat quality and quantity declines and levels of fragmentation increase, annual home-range sizes increase. Studies of owls within and adjacent to the

HCP Planning Area indicate that owls east of the Cascade Crest have smaller home ranges, higher levels of reproduction, and higher turnover rates than spotted owls west of the Crest (Herter and Hicks 1995b; Hicks et al. 1995). Habitat use and use of nesting structures varies between owls east of the crest and owls west of the crest. Owls west of the Crest make greater use of cavities in trees and snags, while owls east of the crest make greater use of dwarf-mistletoe clumps and platforms.

Home range size varied even among adjacent pairs. For example, three adjacent pairs had home ranges of 526, 1,807, and 4,303 acres (95 percent Minimum Convex Polygon). The average distance between owl sites in the HCP planning area is 1.53 miles, indicating that most owl home ranges would begin to overlap with others at approximately 0.75-mile distances from site centers. Home ranges do overlap in the HCP Planning Area, but most owl use in the overlapping areas was during the non-breeding season (Hicks et al. 1995). Within the Eastern Washington Cascades Portion of the Planning Area, 95 percent Minimum Convex Polygon home ranges averaged 3,433 acres in size (equivalent to approximately a 1.3-mile radius). Home-range and habitat-use data in the HCP planning area also indicate that home ranges are not necessarily circular and that use of standard diameter home ranges may not be the best indicator of habitat needs of spotted owls.

Terms used to describe owl habitat have included "suitable" and "nonsuitable" (Final Draft Recovery Plan; USDI 1992); and "A", "B", and "C" habitat (which equate to optimal, suitable, and marginal)(Owl memorandum #3; WDNR 1991). Hicks and Stabins (1995) described nesting, roosting, and foraging habitat in a way which generally overlapped with Types A and B. Owls spent proportionately more time in areas with higher amounts of A/B habitat (Hicks et al. 1995). The average home range among 9 intensively studied pairs contained an average of 1,622 acres of habitat. Data summarized in Irwin and Hicks (1995) suggests that a decrease in spotted owl productivity will occur if suitable NRF habitat decreases below the 30-39 percent category of total habitat available within the home range. Their data also indicated that the amount of NRF habitat (A and B) within 0.7 mile analysis radii provided the best predictor of occupied sites.

Section 2.9 of the HCP emphasizes that "Use of the 0.7-mile 'moving window' does not imply that owls only require that amount of habitat to meet their life requirements; rather, it was the analysis radius which provided the greatest level of discrimination between occupied and unoccupied sites". Appendix 2 (Hicks and Melton 1995) of Technical Report #6 (Irwin and Hicks 1995) contains a test of the model using hypothetical landscapes with equal amounts of nesting habitat, but different spatial arrangements. The model predicted the presence of fewer owl sites on the fragmented landscape.

Hicks et al. (1999) emphasized that protecting significant blocks of mature timber for nesting requirements is important. However, they noted that young forests can provide foraging and roosting habitat for spotted owls adjacent to late-successional forest reserves, as well as habitat for dispersing juveniles and subadults. Spotted owls showed some flexibility in habitat use following disturbance (e.g., fire, harvest, or management). They made a number of recommendations for managing young forests for spotted owl foraging habitat: (1) Avoid disruption of downed logs during logging operations and retain some large woody debris (possibly in well-distributed piles) to help

minimize disturbance of established small mammal communities; (2) Use stocking control practices that accelerate the development of large-diameter stands and understory shrub diversity, to favor higher densities of small mammals; (3) Retain green trees with defects and snags in harvest units to improve habitat for flying squirrels and other small mammals at all forest regeneration stages; (4) Enhance spotted owl hunting habitat by thinning dense stands to facilitate movement through the site, and partially control vegetation to reduce density of low shrubs that may impede the ability of spotted owls to locate and acquire prey; and (5) During thinning or harvest operations, clump leave trees to provide well-shaded sites for owls to roost during the day. They encouraged the application of adaptive management and encouraged managers to consider the needs of spotted owls (the predator), but also the needs of small mammals (the prey) in managing young forest stands. No results are yet available which alter the understanding of home-range and habitat-use relationships within the Planning Area.

Since completion of the Plum Creek Cascades HCP, Washington Department of Natural Resources has also completed an HCP which addresses spotted owls within Plum Creek's HCP Planning Area. One section of DNR-managed land occurs in the west side of Plum Creek's HCP Planning Area. That section is designated as both a NRF management area as well as a nest patch. The Service believes little to no activity will occur on that section. DNR-managed lands within and immediately adjacent to the east side of Plum Creek's HCP Planning Area are mostly designated as NRF management areas, with some areas designated as Dispersal management areas. A cursory assessment of 10 Watershed Administrative Units in this area indicate that timber harvest in owl habitat will be very limited in the near future on these lands. Preliminary estimates indicate that DNR-managed lands contain more than 50 percent NRF in only one watershed where the combined DNR and Federal NRF also exceeds 50 percent. In that watershed, Cle Elum Ridge South, up to 100 acres of owl habitat may be available for harvest. Limited thinnings will be allowed. Additional thinnings may occur in nonhabitat which would provide income to the trust beneficiaries and accelerate development of owl habitat.

Landscape Considerations

Importance of I-90 Corridor: The I-90 Corridor has been identified as a critical link in the conservation and recovery of spotted owls in virtually every range-wide review of the northern spotted owl (Thomas et al. 1990, USDI 1992a,b, Thomas et al. 1993, USDA et al. 1993, USDA and USDI 1994, USDA and USDI 1997); and every State-wide review in Washington State (Hanson et al. 1993; Buchanan et al. 1994). The HCP planning area is important for north-south, as well as east-west, connectivity. This area is strategically positioned between important wildlife conservation lands including: the Alpine Lakes Wilderness to the north; the Teanaway Late-Successional Reserve to the east; the Cedar River watershed to the west; Manastash Late-Successional Reserve and Mt. Rainier National Park to the south, and Norse Peak, Clearwater, and William O. Douglas Wilderness Areas, also to the south.

Connectivity of the spotted owl population from north to south over the I-90 corridor has been raised as a concern for the local area (Thomas et al. 1990, 1993; Hanson et al. 1993). However, because

of the relatively extensive survey work in the HCP Planning Area, known owl densities are similar to or exceed those in regions either north or south of the I-90 corridor. Maintaining viable population clusters and essential habitat linkage in the I-90 area continues to be considered critical for the long-term viability of spotted owls. Few areas along the Crest are low enough in elevation to provide spotted owl habitat and dispersal between the East and West Cascades Provinces (e.g., Steven's, Snoqualmie, and White Passes). Snoqualmie Pass is relatively low in elevation and may offer the best potential for demographic connectivity across the Cascades.

The HCP addressed the importance of this area. One of the Biological Goals for the HCP was the maintenance of spotted owls within this landscape as the most effective way to maintain connectivity as well as to continue to support owls which contribute to the long-term survivability of the population in the Planning Area and the species as a whole. These factors have not changed since the issuance of the Plum Creek Permit and are not altered by the proposed land exchange or subsequent proposed HCP modification.

Snoqualmie Pass Adaptive Management Area: Since completion of the Plum Creek HCP, the Forest Service has completed its planning effort for the Snoqualmie Pass Adaptive Management Area (USDA 1997). The resulting management plan is at least as conservative and protective of late-successional forest characteristics as the modeling effort supporting the HCP had assumed. Completion of that effort solidifies the role for that landscape in the maintenance of forests across the landscape for species which depend on older forest habitats. The Service continues to expect that the HCP and Snoqualmie Pass Adaptive Management Area plan will continue to complement each other on the landscape. The land exchange will consolidate ownership with the Snoqualmie Pass Adaptive Management Area which will benefit many species. It is expected that forests will be more contiguous under the Snoqualmie Pass Adaptive Management Area plan, barring natural disturbance events, than if forest management had occurred on interspersed nonfederal sections. It is also expected that road densities would also be lower as a result. Management of the Snoqualmie Pass Adaptive Management Area remains consistent with the assumptions contained in the HCP and in the Service's 1996 Biological Opinion.

Critical Habitat for the Northern Spotted Owl

Figure 1 of the 1996 Biological Opinion (as well as Figure 5 herein) displayed the areas designated as Critical Habitat Units (CHUs) in the Interstate-90 Corridor. About 112,308 acres of federal lands were included within the outer boundaries of the CHUs. Four spotted owl CHUs will be impacted by HCP modification (WA-13, WA-14, WA-33, and WA-34). These areas correspond closely with Late-Successional Reserves, the Snoqualmie Pass Adaptive Management Area, and with Designated Conservation Areas under the Final Draft Recovery Plan (USFWS 1992). Only those Federal lands with the capability of supporting suitable owl habitat are actually designated as critical owl habitat.

EFFECTS OF THE ACTION

Northern Spotted Owl

The proposed land exchange will result in a net increase of suitable habitat on Federal land, improving conditions for spotted owls. The Service previously consulted on the HCP at the time of Permit issuance. This reinitiation examines the changes the HCP modification will bring to that analysis. Plum Creek lands contain about 20 percent NRF habitat, however, the lands being exchanged to the Forest Service contain about 23-25 percent NRF habitat.

At a landscape level, nothing will change at present with the Land Exchange. Percentage of the landscape in each of the habitat categories will remain the same – only the ownership will change. As time progresses, differences in management will result in differences appearing in landscape amounts of habitat; however, these changes are expected to be small. At year 2016, 26 percent of the HCP Planning Area should be in NRF habitat and 15 percent in FD, for a total amount of 41 percent owl habitat. This is no different than what the Services expected if the land exchange had not occurred. At year 2045, the Service expects 28 percent NRF and 25 percent FD for a total of 53 percent habitat. This represents a 1 percent increase in NRF and a 1 percent decrease in FD from what was expected to occur without the land exchange. These numbers are similar to the 1 percent increase in Mature Forest and older stages (from 44 to 45 percent), and the 1 percent decrease in Dispersal Forest seen in terms of Stand Structural Stage changes. It is expected that 66 percent of the HCP Planning area will be in Dispersal Forest or better by 2045, as opposed to 65 percent without the exchange. Habitat amounts are contained in Table 24A and 30A of ROD Appendix B (note there are two versions of each table – one for minimum Plum Creek ownership and another for maximum Plum Creek ownership). HCP Modification Document Figures 36A, 37A, and 38A give a rough approximation of the distribution of habitat on all ownerships should the escrow and option lands be transferred to the Forest Service. However, those figures did not account for the two murrelet sections remaining in Forest Service ownership.

There may be some additional margin of change on the West Side. Under the original proposal, whereby Plum Creek would have received 2 additional sections of old forest, the Service anticipated 20 percent of the HCP Planning area's west side to be NRF and 12 percent to be FD by the year 2016. This represented a 3 percent and a 1 percent decrease from what was expected to occur without the exchange. At year 2045, the Service expected 20 percent NRF and 20 percent FD, decreases of 3 and 4 percent respectively from what was expected without the exchange. This represented 7 percent less habitat on the west side of the Planning Area than without the exchange. However, about 0.7 percent of the west-side portion of the HCP Planning Area will now be retained in Forest Service ownership as a result of the recent Land Exchange Amendment, and these lands will likely remain in Old Growth and Mature Forest.

With regard to State Spotted Owl Special Emphasis Areas (SOSEAs)(WFPB 1995), the Service estimates that, at year 2045, owl habitat will comprise 43 percent (24% NRF; 19% FD) of the SOSEA areas which have a demographic role in the HCP planning area west of the Cascade crest,

and that owl habitat will comprise 61 percent (34% NRF; 27% FD) of the areas with a demographic role east of the Cascade Crest (USDI and USDC 1999a).

The overall carrying capacity estimate based upon the Resource Selection Probability Function model (Irwin and Hicks 1995) is that 88 pairs exist at present; 84 pair sites would exist in 2016; and 89 would exist in 2045 (Table 4.). This represents 2 and 3 pair sites more than would have been expected if the land exchange does not occur. There are fewer pair sites at present on the West side of the Cascade Crest in comparison to the East side of the Crest; but, the East side is nearly twice as large in area. These numbers are expected to remain relatively constant over the 50- to 100-year Permit period.

Table 4. Estimated Northern Spotted Owl Carrying Capacity (in pair sites) for the HCP Planning Area.

YEAR	WEST I-90	EAST I-90	TOTAL
1997	17	71	88
2006	16	67	83
2016	17	67	84
2026	17	69	86
2036	17	71	88
2045	17	72	89

It is expected that Plum Creek will have a much reduced impact on owls in the HCP Planning Area following the exchange. Their ownership will be reduced by between 22,200 and 40,500 acres. The HCP covered lands included 169,177 acres of Plum Creek ownership and about 1,400 of timber-right lands for a total of about 170,600 acres of covered lands prior to the exchange. HCP covered lands are expected to contain about 130,000 to 148,300 acres following the exchange. A smaller number of owl sites will have the potential to be impacted by Plum Creek operations. Originally, it was anticipated that 20 sites might be impacted in the short term and a total of 50 sites in the short and long term (Herter et al. 1995). With the land exchange and HCP modification, it is now expected than 16 sites would be impacted in the short term and only 31 to 37 sites in short and long term combined, depending on how many escrow and option sections transfer to public ownership. This represents 4 fewer sites in the short term and between 13 and 19 fewer sites in both the short and long term combined that would be impacted.

The 16 sites to be impacted in the short term includes only 7 current or historic reproductive pairs (2 of which are located on the west side), only 4 of these sites are still active (one of the active sites is on the west side). The four active pair sites are #272 Cabin creek, #663 Prospect Creek, # 1036

Left-hand Fork, and #955 Champion Creek Upper. One of the 7 historically reproductive sites was recently reduced to a single site. Therefore, 5 sites are either active pairs or singles. The remaining 11 of the 16 short-term-impact sites have never been reproductive pair sites (9 sites) and/or have been vacant for 4 or more years (6 sites which were never reproductive and 2 historic reproductive sites which have been long vacant). In summary, this means that 3 active pair sites and a single site on the east side, and 1 active pair site on the west side have the potential to be impacted in the short term under the modified HCP.

The reduction in potential sites to be impacted, together with a net increase in habitat and net increase in projected carrying capacity all indicate that the exchange and subsequent modification decrease the amount of take and will be beneficial to spotted owls within the HCP planning Area. This will also improve the function of these lands with respect to the landscapes contribution to the long-term survival of the subspecies.

A review of published literature suggests connectivity begins to deteriorate once late-successional habitat is fragmented and constitutes less than 50 percent of the landscape (USDA and USDI 1997). Following the land exchange, Plum Creek will continue to meet its commitments of NRF and FD habitats. The result will be improvement in amounts of spotted owl habitat with amount of total spotted owl habitat estimated to be at 53 percent of the HCP Planning area at year 2045.

Dispersal failure could lead to population declines. Juvenile spotted owls dispersing across clearcuts or open canopy forest move shorter distances and have an increased probability of mortality (Miller et al. 1997). Herter and Hicks (1995b) also found dispersal distances of successful dispersers to be farther than those of unsuccessful dispersers (18.8 vs. 15.3 miles).

Decreasing dispersal can decrease local populations while habitat loss simultaneously reduces population viability and exacerbates the effects of stochastic events (e.g., fires, floods, food failures, etc.). These factors when combined, may increase the risk of local extinctions. The Service believes that the combination of National Forest lands and Plum Creek HCP lands will provide a network of nesting habitat which is adequately connected by foraging habitat to ensure dispersal capabilities are maintained and enhanced, and that edge effects to patches of nesting habitat are reduced by the presence of surrounding foraging quality habitat.

Under the modified HCP, the total amount of suitable habitat will increase across the landscape over the next 50-100 years (HCP Modification Document Table 24), and overall numbers of owls are expected to be maintained. The most-certain condition to maintain connectivity across a large area such as the HCP Planning Area is not through dispersal habitat alone, but with stepping stones of higher-quality NRF habitat which provide roosting and foraging opportunities, as well as contributes to the maintenance of interspersed productive owl sites. Ideally, with interspersion of productive sites, dispersing owls will be more numerous and have greater probability of reaching adjacent areas. Such conditions of habitat and productive sites will decrease the risk of local extinctions.

A total of 1,158 acres of deferrals around 9 spotted owl sites are expected within the Green River watershed, including 5 deferrals of NRF habitat (310 acres) and 6 corridors of FD habitat (848 acres) (H. Stabins, Plum Creek, personal communication, 1999)(Figure 2.). Although Plum Creek will consolidate land between the Green and Cedar Rivers, the post-exchange ownership will be a relatively linear polygon. Several sections of National Forest land will also be retained in the vicinity. Combined, these factors should provide spotted owl dispersal potential between the Kelly Butte Special Management Area and the Cedar River. These same landscape features will also likely contribute to demographic and dispersal connectivity between the Green River and Snoqualmie Pass (Figure 5.).

Across the Planning Area, Plum Creek will maintain NRF deferrals on 1,102 to 1,855 acres, and FD deferrals on 1,267 to 2,287 acres for a total of up to 4,142 acres. These values depend on the disposition of escrow and option lands which contain 753 acres of NRF deferrals and 1,020 acres of FD deferrals. Goshawk deferrals on 101 to 262 acres would also benefit spotted owls.

Critical Habitat for the Northern Spotted Owl

Concurrent with these effects are impacts to critical habitat. Critical habitat is considered "essential to the conservation of the species" and the Act defines conservation as the equivalent to recovery. Section 7 prohibitions apply to Federal actions that would impair survival and recovery of spotted owls or that would destroy of adversely modify designated critical habitat (USFWS 1992b). When determining whether any particular action would appreciably diminish the value of a CHU for contributing towards the survival and recovery of spotted owls, the Service must consider the expected role of the individual CHU, the baseline conditions of the CHU, and the interdependence of the CHU with other CHUs. However, Federal agencies are directed to evaluate impacts to critical habitat in relation to the full range of the subspecies.

Four spotted owl CHUs will be impacted by HCP modification (WA-13, WA-14, WA-33, and WA-34). See Figure 1 of the 1996 Biological Opinion or Figure 4 herein. Two of these CHUs are located east of the Crest and two are located west of the Crest. Some of the lands being acquired by Plum Creek are currently designated as critical habitat. Some of the lands being acquired by the Forest Service are located interspersed with designated critical habitat and may be designated as critical habitat at some future time. To assess the relative impacts and benefits of the land exchange, the Service analyzed the exchange of habitat by geographic portions of the HCP Planning Area (Figure 3.). These geographic areas do not exactly match CHU boundaries as CHUs sometimes straddle the Cascade Crest. However, these numbers are still useful for perspective.

East Side CHUs

Plum Creek will trade or sell a total of 27,900 to 45,600 acres in Kittitas County to the Forest Service. Plum Creek will receive 4,200 acres from the Forest Service in Kittitas. The acreage going to Plum Creek east of the Crest is east of Cle Elum Lake and north of Ronald, as well as along the North Fork of Manastash Creek and near Gnat Flat. The area north of Ronald is not expected to provide for connectivity because of existing land ownership and management practices. The area around Gant Flat is at the edge of spotted owl habitat and is adjacent to the L.T. Murray Game

Management Area. On the east side of the Planning Area, the Forest Service will gain a total of 13,087 to 21,442 acres of owl habitat (7,318 to 11,833 acres of NRF and 5,771 to 9,610 acres of FD habitat). Within the CHUs on the east side of the Crest, the Forest Service will acquire 9,131 to 16,338 acres of owl habitat (5,465 to 9,660 acres of NRF and 3,667 to 6,679 acres of FD).

Northeast ~ CHU WA-13 (north of I-90 and east of the Crest) has about 54,496 acres of land, including about 23,963 acres of suitable habitat. The Forest Service will trade out of 2,245 acres of designated critical habitat. However, at least 20,412 acres and up to 32,693 acres of Plum Creek land will be added to the National Forest System within or adjacent to the CHU boundary. Although not designated CHU, these lands will be managed under the Northwest Forest Plan, contributing to the viability of spotted owls and other late-successional dependent species. These lands are within the SPAMA Boundary and are expected to be managed for late-successional species and to enhance connectivity for such species as the northern spotted owl. Of the area to be exchanged to the Forest Service in this region, the net change in Forest Service ownership of currently suitable spotted owl habitat will be an increase of approximately 9,904 to 14,754 acres (5,977 to 8,396 acres of NRF and 3,928 to 6,358 acres of FD). In the Northeast, 6,312 to 10,465 acres of owl habitat within CHUs will be exchanged to the Forest Service (4,049 to 6,195 acres of NRF and 2,263 to 4,270 acres of FD). Within CHU 13, the Forest Service will gain 6,312 to 10,468 acres of owl habitat (4,049 to 6,197 acres of NRF and 2,263 to 4,271 acres of FD). The boundaries of CHU 13 and the Northeast portion of the Planning Area align very well.

Southeast – CHU WA-14 (south of I-90, east of the Crest) has only portions of one section (T19N, R12E,Section 7) of CHU that will be exchanged to Plum Creek, while 10-15 sections are proposed for exchange from Plum Creek to the Forest Service within or adjacent to the CHU boundary. The exchange will result in the loss of 412 acres of critical habitat in CHU WA-14 and 1,497 acres of National forest land adjacent to the CHU. However, at least 6,815 acres and up to 12,295 acres of Plum Creek land will be added to the National Forest System. Of the area to be exchanged to the Forest Service in this region, the net change in Forest Service ownership of currently suitable habitat will be an increase of approximately 3,183 to 6,688 acres (1,341 to 3,437 acres of NRF and 1,843 to 3,252 acres of FD). The land added to the National Forest System is within or adjacent to the CHU boundary and within the Manastash Late-Successional Reserve. The Manastash Late-Successional Reserve is expected to support a "source" population of spotted owls and contribute significantly to spotted owl recovery in the Eastern Cascades Province. Reducing the amount of checkerboard ownership within this Late-Successional Reserve/CHU by blocking-up Federal ownership will augment efforts to attain this goal.
In the Southeast, 2,819 to 5,873 acres of owl habitat within CHUs will be exchanged to the Forest Service (1,416 to 3,465 acres of NRF and 1,404 to 2,409 acres of FD. Within CHU 14, the Forest Service will gain 2,703 to 5,757 acres of owl habitat (1,306 to 3,356 acres of NRF and 1,397 to 2,401 acres of FD. Within the southeast, the Forest Service will gain about 116 acres of owl habitat (110 acres of NRF and 7 acres of FD) which lies within the CHU WA-33.

West Side CHUs

Plum Creek will trade a total of 2,900 to 3,400 acres in King County (West of the Cascade Crest) to the Forest Service and in exchange will receive about 4,400 acres. This will result in a net change of 1,626 acres of suitable habitat (a gain for Plum Creek of 1,982 acres of NRF and a loss of 356 acres of FD). Plum Creek will have a net gain of 1,366 acres of owl habitat within the outer boundary of the CHUs on the west side of the Cascade Crest (a gain for Plum Creek of 1,698 acres of NRF and a loss of 333 acres of FD).

Southwest and Central West – CHU WA-34 (Green River Watershed): The Forest Service will trade out of 3,198 acres of designated critical habitat. The Forest Service will also exchange an additional 1,217 acres outside but adjacent to the CHU WA-34 boundary. About 2,408 acres of Plum Creek land will be added to the National Forest System within the CHU boundary. Of the area to be exchanged to the Forest Service in these regions, the net change in Forest Service ownership of currently suitable spotted owl habitat will be a decrease of approximately 1,773 acres (2,102 acres of NRF and a Forest Service gain of 329 acres of FD). The exchange of lands within this watershed occurs at or adjacent to the north boundary of CHU WA-34. Blocks of both Forest Service and Plum Creek lands will be consolidated within the CHU boundary. The action will reduce CHU WA-34 from 113,620 acres to 109,278 acres in size, including a loss of 1,366 acres of suitable habitat (a loss of 1,698 acres of Forest Service NRF and a gain of 332 acres of FD). Within the Southwest/Centralwest portion of the Planning Area, the Forest Service will exchange out of 1,366 acres of owl habitat (including a loss of 1,698 acres of NRF and a gain of 333 acres of FD). WA-34 is the only CHU in the Southwest and Central West portions of the Planning Area.

The legislated exchange created the Kelly Butte Special Management Area south of the Green River. It forms a block of about 5,600 acres of Federal land by combining about 2,400 acres of Plum Creek lands and re-designating about 2,500 acres of Matrix, over 400 acres Late-Successional Reserve, and 300 acres of Administratively Withdrawn lands, in an area that is presently checkerboard ownership. Although little old-growth occurs in this block, about 1,800 acres is estimated to be Mature Forest or better.

The area is to be managed with the following emphasis:

a) preserve the natural character and protect and enhance water quality;
b) permit hunting and fishing;
c) provide opportunities for primitive and semi-primitive recreation and scientific research and study;
d) protect and enhance populations of fish, wildlife and native plant species; and,
e) allow for traditional uses by Native American peoples.

Commercial timber harvest and road construction will be prohibited and the area closed to motor vehicles. The Kelly Butte Special Management Area extends contiguous Federal land into a key area that is currently intermingled ownership. It is located in an important area in terms of providing spotted owl demographic support and is expected to significantly contribute to spotted owl recovery in this watershed.

Northwest – CHU WA-33 (north of Green River and west of the Crest) The Forest Service will not be exchanging any designated critical habitat within CHU WA-33. However, approximately 1,138 to 1,616 acres of Plum Creek land within and adjacent to the CHU will be added to the National Forest System. Of the area to be exchanged to the Forest Service in this Northwest portion of the Planning Area, the net change in Forest Service ownership of currently suitable spotted owl habitat will be an increase of approximately 147 acres (120 acres of NRF and 27 acres of FD). Lands being added in or next to the CHU are near or along the Crest and are expected make minor contributions to east-west connectivity. An analysis for CHU WA-33, which includes some lands east of the Cascade Crest indicates that 109 acres of NRF and 6 to 30 acres of FD habitat will be transferred to the Forest Service for a total of 117 to 140 acres of total owl habitat. These lands correspond to the portions of WA-33 on the east side. Within the Northwest portion of the Planning Area, there is no exchange of habitat within the outer boundary of CHUs.

The Cedar River (Municipal Watershed for the City of Seattle lies between the Central West and Northwest portions of the Planning Area. With regard to the Washington State Spotted Owl Special Emphasis Areas, 48,877 acres of the I-90 West SOSEA occurs in the municipal watershed. The watershed and the SOSEA within the watershed also include 22,845 acres of Critical Habitat Unit WA-33. The anticipated management by the City of Seattle within the municipal watershed should lead to enhanced conditions for demographic support and dispersal.

Discussion

The analysis indicates that CHUs in Northwest, Northeast, and Southeast benefit from the modification, while the CHU in the southwest and Central West (WA-34) experiences a loss of habitat. The majority of the net change in habitat occurs within the Central West portion of the Planning Area. In this area, 1,762 acres of habitat (1,508 acres of NRF and 254 acres of FD) will be transferred to Plum Creek. Impacts to CHUs in the southwest portion of the Planning Area are somewhat offset by the creation of the Kelly Butte Special Management Area. Overall, the modification results in an increase of 11,461 to 19,816 acres of owl habitat (5,336 to 9,851 acres of NRF and 6,127 to 9,966 acres of FD) on Federal lands in the HCP Planning Area. It also results in an increase of 7,765 to 14,974 acres of owl habitat (3,767 to 7,962 acres of NRF and 4,000 to 7,012 acres of FD) within the outer boundaries of CHUs within the Planning Area. The land exchange and subsequent HCP modification will improve the quality and function of that habitat for spotted owls.

However, at the time critical habitat was designated for the spotted owl, there was no coordinated mechanism to effectively implement or evaluate rangewide management of spotted owl habitat. Since that time, the Northwest Forest Plan was signed into action (USDA and USDI 1994b), as were several large-scale HCPs. This evolution in conservation strategies has de-emphasized the role of CHUs.

North-south connectivity across the I-90 Corridor will be significantly improved by the post-exchange distribution of Federal ownership and habitat (See Figure 5; and HCP Modification Document Figures 36A, 37A, and 38A). The viability of the key Kachess-Cle Elum corridor is

strengthened by blocking-up Federal ownership throughout the length of the corridor: the area between the two lakes will become a nearly contiguous block of Federal lands; Federal ownership will be extended south to the Yakima River (immediately north of I-90); Federal lands will extend much closer to the south side of I-90; and Federal lands in the Manastash Late-Successional Reserve will be added in an area of commingled ownership. Three important parcels will be acquired adjacent to I-90 in the Keechelus-Kachees corridor. Although this action alone does little for immediate connectivity, it does secure lands that may be vulnerable to future development. In combination with additional parcels acquired by the Forest Service between Keechelus and Kachees Lakes, they increase the likelihood of eventual connectivity in this central corridor. The long-term benefits of securing habitat in this area are expected to extend to the Province level by contributing to the establishment connectivity across the I-90 area.

The level of potential dispersal habitat remaining between the Cedar River and Kelly Butte Special Management Area will depend in part on how Plum Creek implements their HCP. Plum Creek will acquire about 4,400 acres that will be incorporated into their HCP west of the Cascade Crest. Within the Green River, this represents a net change of about 2,000 acres of increased Plum Creek ownership. North of the Green River, the net gain for Forest Service includes 500 to 1,000 acres. Much of the spotted owl habitat in and around the lands going to Plum Creek occurs in small, isolated patches. Combinations of NRF and FD are expected under the HCP which will complement Northwest Forest Plan lands and together be conducive to both dispersal and occupancy of owls (Figure 5).

Summary of Effects

The Land Exchange consolidates currently unroaded areas and reduces potential road-easement requests. Following the exchange, new Federal lands will be almost entirely Adaptive Management Area or Late-Successional Reserve and most of these lands occur within the boundaries of CHUs. The HCP modification will allow the consolidation of existing habitat, ensuring long-term interior habitat, reducing forest fragmentation, and reducing road densities. These factors are expected to enhance the survival and reproduction of spotted owls throughout the HCP Planning Area. Directly enhancing individual spotted owl fecundity, dispersal, and survival within the HCP Planning Area is expected to benefit spotted owl local and meta-populations in the Eastern and Western Cascades Provinces by increasing inter- and intra-provincial connectivity. The benefits of these actions are expected to extend to the range-wide conservation and recovery of spotted owls.

Connectivity across I-90 should maintain both demographic and genetic connection of spotted owls among provinces and sub-provinces. Connectivity between populations provides for genetic interchange and reduces the threat of local extinctions from stochastic events. Maintenance of healthy provincial populations will contribute to the survival and recovery of the subspecies.

INTERRELATED AND INTERDEPENDENT EFFECTS

Interrelated actions are part of the larger action and depend on the larger action for their justification. Interdependent actions are actions having no independent utility apart from the proposed Federal action. Regulations implementing section 7(a)(2) of the Act require the Service to consider the effects of activities that are interrelated or interdependent with the proposed Federal action (50 CFR §402.02). Both interrelated and interdependent activities are assessed by applying the "but-for test" which asks whether any action and its resulting impact would occur "but-for" the proposed action.

Interrelated and interdependent activities that may occur include timber-related activities and firewood cutting which may both result in a small increase in the frequency of fire starts. An increase in fires could result in the loss of owl habitat on Federal lands or Plum Creek lands. Fire fighting may also result in disturbance to nesting owls. New road construction and increased traffic could disturb owls in remaining habitat. The HCP does contain disturbance provisions which protect owl nesting sites on both Plum Creek and other ownerships. As Plum Creek ownership on the west side of the Crest is only increasing by 2,000 acres, additional road construction and firewood cutting is expected to be minimal. Additionally, much of the lands being acquired by Plum Creek do not lend themselves to high road densities as a result of steep slopes and high mass-wasting potential. Cable-yarding and other yarding methods (e.g., helicopter yarding) are expected to be used in many areas.

Perhaps the largest interdependent activity is the exchange itself. The action on which the Service is consulting in this document is modification of the HCP. The exchange itself was legislated by the U.S. Congress. Another section 7 analysis being completed by the Service and the National Marine Fisheries Service analyzes the effects of the exchange itself (both within and outside the HCP Planning Area) and re-designation of federally acquired lands.

The Alaska National Interest Lands Conservation Act (P. L. 96-487), approved December 2, 1980 (94 Stat. 2457; 16 U.S.C. 3210), directs the Secretary of Agriculture to provide access to nonfederally owned lands within the boundaries of the National Forest System. Plum Creek currently has 40 requests for road easements across Wenatchee National Forest lands within the I-90 exchange lands east of the Crest. The land exchange will eliminate 31 of 40 road-access requests by Plum Creek that are currently pending on east-side lands. Nine road-access requests have been approved by the Wenatchee National Forest, pending Service concurrence under section 7 consultation.

Plum Creek has seven requests for road access across National Forest lands that have been approved by the Forest Service and have completed section 7 consultation on the west side. Because the land exchange will consolidate ownership in this parcel group, six of the seven road-access requests by Plum Creek will no longer be needed. This reduction in road easements within the Green River watershed will decrease forest fragmentation and related impacts of roads to wildlife and aquatic resources.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Biological Opinion. The 1996 Biological Opinion, the 1996 FEIS, and the 1999 FSEIS addressed cumulative impacts and are herein incorporated by reference. This opinion addresses cumulative effects below. However, future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Actions on nonfederal lands, such as urban development, logging, road building, and recreation will continue to contribute to habitat degradation and loss which will adversely affect spotted owls and murrelets. The development of private lands and associated loss of habitats is anticipated to continue. Habitat fragmentation, habitat loss, and habitat degradation are expected to continue as development fuels the demand for new public services and facilities. Disturbances caused by human development in low-elevation areas has, and will continue to have, a cumulative impact on species through loss of habitat and displacement of individuals of wildlife species, including spotted owls and murrelets.

Forest dynamics, past timber-management practices, mixed land-ownership, orographic influences, an array of large water bodies, non-forested habitats, and I-90 itself have influenced the amount and pattern of remaining owl habitat. Maintaining existing spotted owl habitat east of the Crest is complicated by the nature of mixed-conifer stands. The area is naturally fragmented and has high potential for loss of habitat due to catastrophic fires and outbreaks of insects and disease. Habitat loss is generally considered to be a more significant factor than arrangement of remaining habitat.

Fragmentation is often cited as a major threat to wildlife survival, but has been generally poorly understood and often confused with habitat loss. The application of the "island" concept to forested habitats may not be accurate given the lack of a "hostile sea" for many forest species (Rochelle 1999). There is little evidence of negative effects on vertebrate biodiversity from fragmentation in western forests. Increased predation and nest parasitism are common when forest edge is surrounded by agriculture or developed lands, are not as evident where surrounding lands remain in forestry. The total amount of habitat is of greater significance to vertebrate survival and reproduction than its configuration. This indicates the threats to wildlife from conversion of forests to nonforest uses is particularly important.

Kittitas County, in conjunction with the Snoqualmie Pass Community Council, developed a long-term comprehensive plan that addressed zoning for private lands near the bases of the ski areas at The Summit at Snoqualmie Pass (The Summit) but not owned by The Summit. County approval was given for 400 housing units at the base of Summit East and 240 housing units and a new hotel at the base of Summit Central. Potential also exists for shopping and condominiums to be developed north on I-90 and east of Snoqualmie Pass). While these lands may have lesser value as nesting habitat for spotted owls and marbled murrelets due to their high elevation, they nonetheless constitute a disruption in potential connectivity for spotted owls and other listed Permit species.

A Master Plan under development by Trendwest Resorts, Inc., proposes the construction of a resort complex between Cle Elum Lake and I-90, near the confluence of the Cle Elum and Yakima Rivers. The resort would develop over 6,000 acres of a 7,400 acre parcel. The plan includes two 18-hole, championship golf courses, an equestrian center with 100 stalls, 60 to 70 miles of trails, a cross-country ski center, an ice skating facility, and areas developed for sledding, sports fields, tennis courts, picnicking, several swimming pools, etc. Included in the proposal is the construction of a 300-unit lodge/convention center, a 300-unit recreational-vehicle park, a 200-unit retreat lodge, and a 50-unit ranch lodge. Nearly 3,000 residential homes and 800 condominiums are also planned. Construction, sales, and marketing is projected to continue for about 30 years (Trendwest Resorts, public information release). While much of the Trendwest property is not suitable nesting habitat due to the tree species composition and the current forest health problem, conversion to nonforested habitat and associated development would nonetheless constitute a disruption to connectivity for spotted owls and other listed Permit species.

Corridor development continues, concentrated within 2 miles either side of the Interstate. It is expected that this development will continue and will spread north and south from the interstate along level uplands and along benches lower on the slopes of adjacent areas. This development of residential, and eventually commercial and industrial, areas is most likely the largest potential disruption to wildlife connectivity north and south through this important connectivity area.

Both the Cities of Seattle and Tacoma are pursuing Habitat Conservation Plans in their respective watersheds. While the plans are somewhat different in specifics, both plans are expected to address spotted owls and murrelets. Tacoma Public Utilities owns about 13,000 acres in the Green River which are located primarily along the mainstem of the Green River and in somewhat of a checkerboard pattern. However, the Cedar River watershed (City of Seattle), immediately north of the Green River, is owned by Seattle Water Department and so there is greater control on access and on landscape conditions. The Cedar River Watershed should provide demographic support for spotted owls in the Western Cascade Province. Both municipal lands should provide contiguous blocks of habitat which will benefit connectivity. However, as these proposed permits will be the subject of future section 7 consultations with the Federal agencies, these efforts were not considered in this reinitiation regarding the request for modification of the Plum Creek HCP resulting from the land exchange.

CONCLUSION

After reviewing the current status of spotted owls and designated critical habitat for spotted owls; the environmental baseline for the HCP Planning Area; the effects of the legislated land exchange and subsequent HCP modification, as well as the cumulative effects, it is the Service's biological opinion that the HCP modification, as proposed, is not likely to jeopardize the continued existence of spotted owls, or result in the destruction or adverse modification of designated critical habitat for the spotted owl. This conclusion is based on the decrease in effects to take as a result of this action. As a result of this action, it is expected that the number of owls impacted in the short term and in long term will be even less than would have been impacted under the original HCP. It is also

expected that landscape amounts of habitat will be increased. With respect to critical habitat, the conclusion was based upon the generally improving conditions. Federally owned critical habitat is anticipated to increase by about 11,000 to 20,000 acres as a result of this action.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The proposed HCP modification and its associated documents clearly identify anticipated impacts to affected species likely to result from the proposed taking and the measures that are necessary and appropriate to minimize those impacts. All conservation measures described in the proposed HCP modification, together with the terms and conditions described in the associated Implementation Agreement and section 10(a)(1)(B) permit, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within this Incidental Take Statement pursuant to 50 CFR §402.14(i). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(B) and section 7(o)(2) of the Act to apply. If the Permittee fails to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(B) permit and section 7(o)(2) may lapse. The amount or extent of incidental take anticipated under the proposed HCP modification, associated reporting requirements, and provisions for disposition of dead or injured animals are as described in the HCP and its accompanying section 10(a)(1)(B) permit.

AMOUNT OR EXTENT OF TAKE

Based on the best information currently available on spotted owl use of the project area, we anticipate the harm of up to 83 owl sites (~166 owls) as a result of proposed timber-harvest activities within 1.8 miles or 0.7 miles of site centers over the course of 100 years according to the schedule in Table 4 of the 1996 Biological Opinion.

The Service also anticipates that incidental take attributable to the proposed actions would result from the loss of suitable habitat within the 70-acre core surrounding nest sites or activity centers. Based on the best information currently available on spotted owl use of the project area, we do not anticipate the harm of additional owls beyond those already identified above.

The Service expects incidental take in the form of harassment to be minimal. As an additional precaution, road building and timber harvest will be restricted near known nest sites during the breeding season. Project-specific surveys and owl-monitoring surveys will continue to identify many of the resident owl pairs.

The total take in the form of harm expected as a result of the proposed action continues to be 83 owl sites. Of these sites, many are not pair sites, and instead are either unoccupied, occupancy is questionable, or they are occupied by resident singles. The distribution of that take (harm) will likely be skewed toward the earlier years of the HCP. Under the Permit, Plum Creek will be authorized to take all northern spotted owls associated with activities conducted under the HCP.

The Fish and Wildlife Service will not refer the incidental take of any migratory bird for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

EFFECT OF THE TAKE

In the accompanying biological opinion, the Service determined, for the following reasons, that this level of anticipated take is not likely to result in jeopardy to northern spotted owls or the destruction or adverse modification of critical habitat.

Take in the form of harm and harassment may occur; unknown sites may be subject to timber-harvest during the breeding season or individual owl pairs may be subject to associated disturbance. Known sites may be subject to habitat removal which may inhibit the ability of those owls to survive and reproduce. However, sufficient amounts and quality of habitat are expected to be present to provide owls with an opportunity to maintain their numbers within the Planning Area at or above critical levels.

It is the Service's opinion that a small loss of habitat across the Planning-Area landscape (<10%), and the subsequent potential decline in numbers of individuals within the Planning Area (<10%), is within acceptable levels. This corresponds to a small percentage of the 1,113 owl sites found within the State of Washington.

Owls and Murrelets

REASONABLE AND PRUDENT MEASURES

The Service continues to believe the following reasonable and prudent measures, contained within the June 24, 1996, Biological Opinion, remain necessary and appropriate to minimize take of spotted owls and marbled murrelets:

1. Any incidental take of (species) must comply with all the terms and conditions of the Section 10(a)(1)(B) permit (including the provisions of the Implementation Agreement and the HCP, as amended) to ensure that conservation measures included to protect the various species are properly implemented.

TERMS AND CONDITIONS

In order to be exempt from the prohibitions of Section 9 of the Act, the Service must comply with the following terms and conditions, which implement the reasonable and prudent measures described above, and outline required reporting and monitoring requirements. These terms and conditions (also contained in the June 24, 1996, and July 13, 1998, Biological Opinions) are nondiscretionary and remain intact:

1. A Section 10(a)(1)(B) permit, as evaluated in this Biological Opinion, must be issued by the Fish and Wildlife Service. The Implementation Agreement for the Habitat Conservation Plan for the Section 10(a)(1)(B) permit must be agreed to by the Fish and Wildlife Service, and the Permit conditioned upon implementation of the Habitat Conservation Plan and the Implementation Agreement.

2. The Service has provided a protocol for the handling of dead, injured or ill listed species for pesticide analysis. When the Service suspects a species has been taken in violation of label restrictions, the incident(s) shall be reported to the Division of Law Enforcement or their designee in the Region in which the species is found. Instructions for proper handling and disposition of such specimens will be issued by the Division of Law Enforcement: Assistant Regional Director; Division of Law Enforcement; 911 N.E. 11th Avenue; Portland, Oregon 97232-4181; (503) 231-6125

3. The Service shall amend Permit condition (H) to read as follows: *The Permittee will notify the Service if locations of nesting murrelets not described in the HCP are discovered, if additional owl site centers not described in the HCP are discovered, if additional stream reaches are found to contain bull trout, or if any observations of wolves or grizzly bears are made within the HCP Planning Area during the course of the HCP.*

Notice: To the extent that this statement concludes that take of any threatened or endangered species of migratory bird will result from the agency action for which consultation is being made, the Service will not consider such take to be a violation under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. 703-712), if such take is in compliance with the terms and conditions (including amount and/or numbers) specified herein.

The Service believes that no more than the murrelets associated with 473 acres of surveyed low-quality murrelet habitat (or 663 acres of mature forest or better; includes low-quality and marginal habitat) will be incidentally taken as a result of the proposed action on the west side of the Cascade Crest. We also believe that no more than the murrelets which may be associated with 1,071 acres of suitable habitat east of the cascade Crest will be incidentally taken.

The Service believes that no more than 83 spotted owl sites will be incidentally taken as a result of the proposed action.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Service's Western Washington Office must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service offered the following conservation recommendations in the June 24, 1996, Biological Opinion:

1. The Service should provide technical assistance to Plum Creek throughout the term of the Permit.

2. The Service should provide technical advice on monitoring and other biological issues associated with implementation of the HCP.

3. The Service should conduct regular compliance monitoring and review the periodic reports.

4. The Service should assist Plum Creek in coordinating with surrounding landowners, particularly the U.S. Forest Service.

5. When the Service is notified that an area that may be suitable for use by bald eagles for communal night roosting may be subject to harvest, the Service should survey that area for bald eagle use prior to harvesting. Surveys should be carried out when bald eagles would be expected to use the area. The bald eagle wintering activity period extends from October 31 through March 31.

6. The Service should review progress made by Plum Creek and provide advice regarding updates and improvements to inventory data, including understory composition, downed woody debris, snags, and standing defective trees; and corresponding updates to the stand structure and composition data.

7. At the time of proposed listing, the Services should solicit public and scientific comment on the addition of that species to applicable incidental take permits which include unlisted species agreements in the Federal Register notice of proposed listing.

With respect to bull trout, the Service offered the following additional conservation recommendations in the July 13, 1998, Reinitiation of the Biological Opinion:

8. The Service should encourage the development of Habitat Conservation Plans and other similar conservation efforts on State, Tribal, and private lands within the range of the bull trout, which will allow for increased conservation benefits that tie directly to efforts on Federal lands in providing a comprehensive management strategy to conserve bull trout populations. Conservation activities will be necessary to improve the connectivity between populations, and to restore habitat within population areas.

9. The Service should encourage the implementation of adequate riparian buffers on State, Tribal, and private lands for any type of stream that has the potential to impact bull trout, but particularly the ephemeral or intermittent streams that may deliver water, sediment, and wood to bull trout streams, for which protection under Washington Forest Practice Rules in their current state are particularly inadequate for the protection and restoration of bull trout.

10. The Service should encourage development and implementation of a comprehensive road-network management plan on State, Tribal, and private lands. Generally, bull trout thrive in landscapes where impacts from roads are minor. Roads within riparian areas, roads with chronic sediment problems, and roads that are likely to fail should be upgraded, relocated, or removed.

11. The Service should encourage and seek opportunities to implement habitat-restoration efforts on those State, Tribal, and private lands that have already been negatively impacted from timber-harvest activities or other habitat-degrading actions. Restoration activities such as decommissioning roads, removing impassible culverts, stabilizing areas prone to erosion, and replanting of riparian areas, will help restore degraded bull trout habitat. Although preventing habitat degradation is easier and less-costly than restoring habitat after it has been impacted, the

Service should still seek future opportunities on those State, Tribal, and private lands that may have been degraded in the past and offer opportunities for improvement, in conjunction with State, Tribal, and private partners and cooperators.

12. The Service should ensure that the status and trend of the small, isolated stocks of bull trout within the action area are monitored.

13. The Service should incorporate channel-migration zones and channelized debris-flow zones into its consideration during HCP negotiation and development. This concept should also be incorporated whenever adjustments are made to riparian strategies as part of adaptive management or as suggested amendments by the Permittee.

With respect to the HCP modification to accommodate the I-90 Land Exchange, the Service offers the following additional conservation recommendations:

14. A report summarizing implementation of all conservation recommendations should be prepared within one year of the periodic report submitted by Plum Creek, or December 31, 2000, whichever occurs first. This report should be made available to affected State and Federal agencies, the Tribes, and interested members of the public.

15. The Service should focus land-acquisition efforts in areas outside of the lands zoned for long-term forestry and utilize every opportunity to enhance habitat connectivity across the I-90 corridor within the Cascade Mountains, particularly in habitats subject to impending development.

16. The Service should cooperate with Plum Creek and the Forest Service in the conduct of a feasibility study regarding reintroduction of bull trout to streams where they are believed to have occurred historically but are now extirpated.

17. The Service should encourage the Forest Service to retain low-elevation mature and old-growth forests in future exchanges and land transactions.

18. The Service should encourage Plum Creek to retain low-elevation mature and old-growth forests for alternative economic purposes whenever such is present (e.g., mitigation banking or alternate forest products).

19. The Service should encourage Plum Creek and the Forest Service to cooperatively implement effectiveness monitoring and research on impacts of forestry on a landscape basis, and continue to pursue science-based adaptive management.

In order to document actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service's Western Washington Office shall provide, in writing, reports of the implementation of any conservation recommendations at the time of the periodic reporting. The

variances from the recommendations may be reported instead. This report should be prepared in accordance with conservation recommendation number 14 for the first reporting interval.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the actions outlined in the reinitiation request. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of incidental take is exceeded; (2) New information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) The agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) A new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Item 2 above, regarding new information, could include deviations from the Northwest Forest Plan. Should such deviations occur to the extent that the baseline is significantly altered or the integrity of the HCP and its assumptions are compromised, consultation would be reinitiated. If you have any questions regarding this biological opinion, please contact William Vogel of my staff at (360) 753-4367 or the letterhead phone/address.

Gerry A. Jackson

wov/bp

c: FWS, Portland (H. Hollis, J. Brown)
FWS, Lacey (W.Vogel, C. Hansen, J. Michaels, K. Benkert, W. Noble, J. Hiss, J. Grettenberger)
NMFS, Lacey (S. Landino, M. Longenbaugh, M. Parton, D. Carlson)
DOI, Portland (D. Hoobler)
DOC, NOAA General Counsel (M. Rowland)
USFS, Cle Elum (F. Rogalski, S. Johnson, E. White)
Plum Creek Timber Company (M. Collins, M. Yeager, H. Stabins, L. Hicks, J. Kraft)

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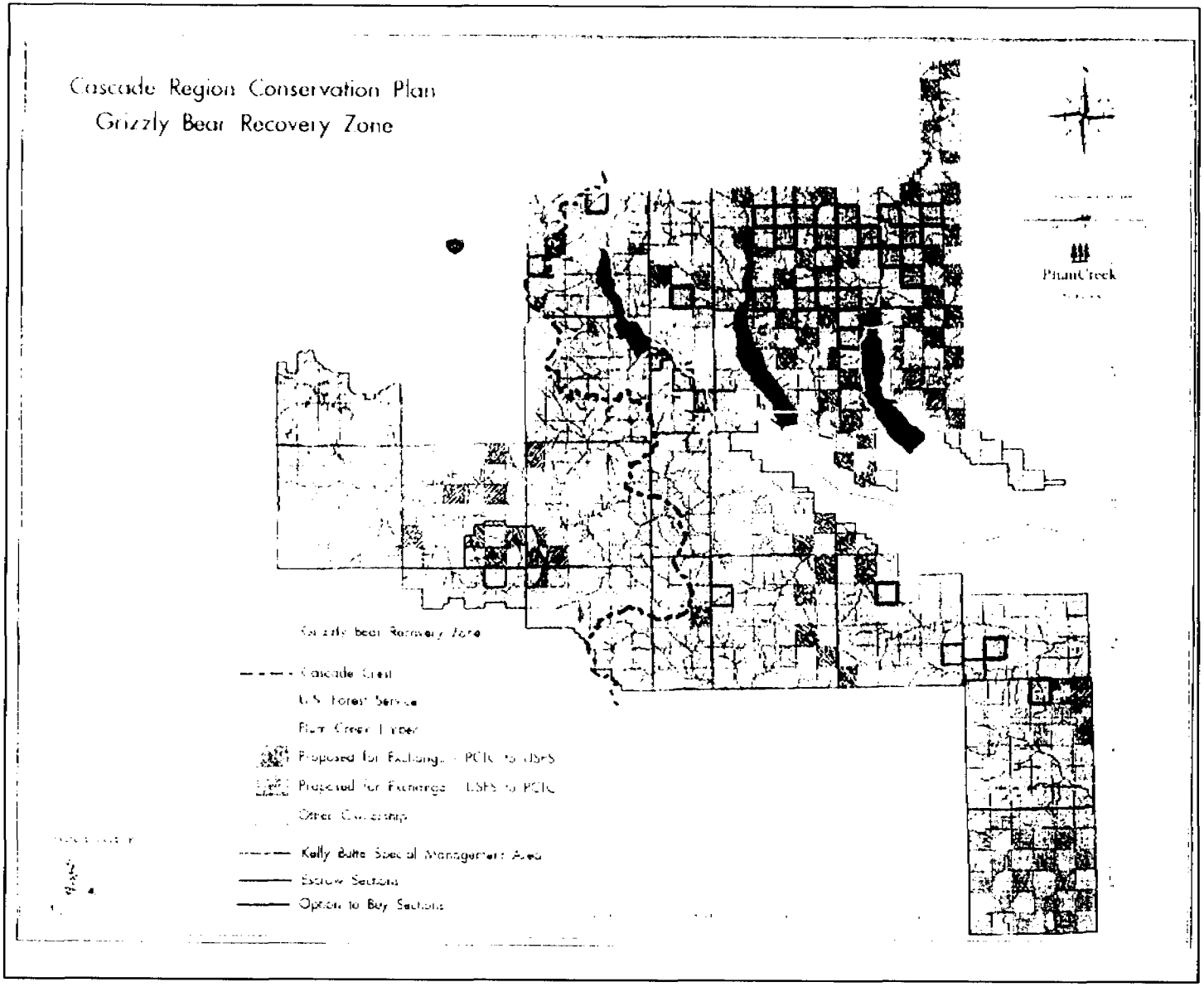

Figure 1. Map of exchange, escrow, and option lands relative to North Cascades Grizzly Bear Recovery Zone.

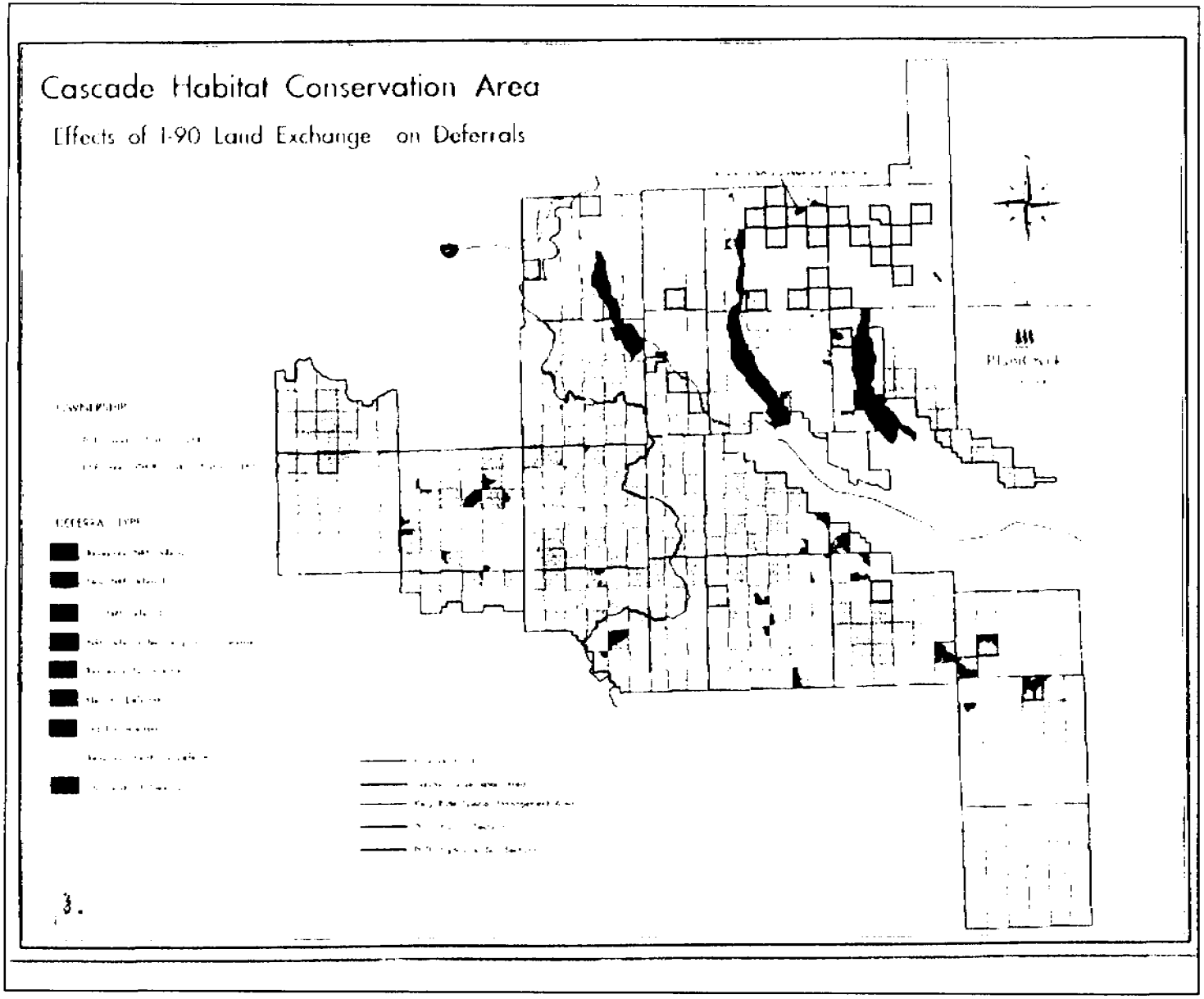

Figure 2. Map depicting changes to harvest deferrals as a result of the land exchange.

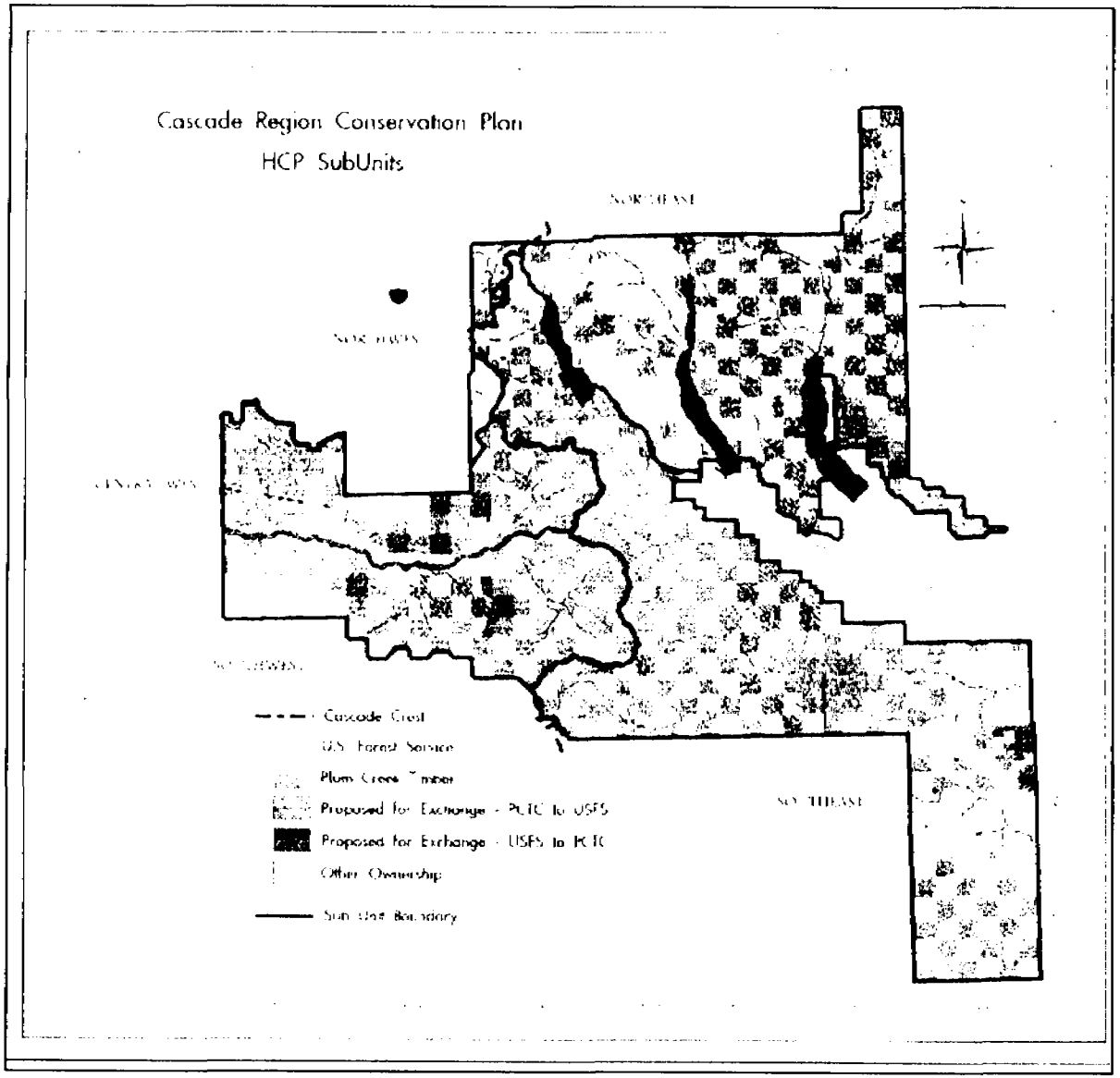

Figure 3. Map of HCP Planning Area and geographic subunits used for analytical purposes.

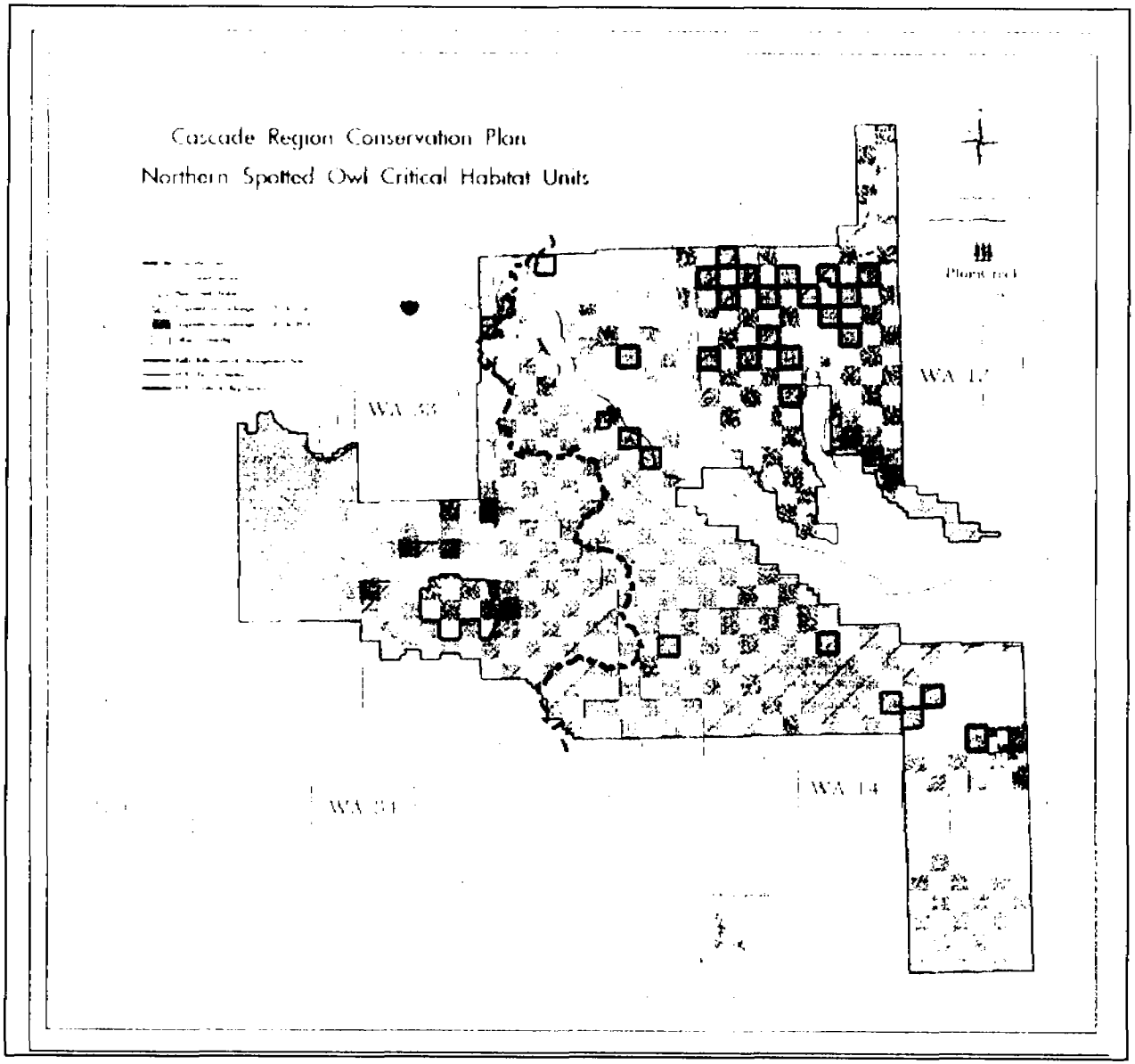

Figure 4. Map of northern spotted owl critical habitat units within the HCP Planning Area.

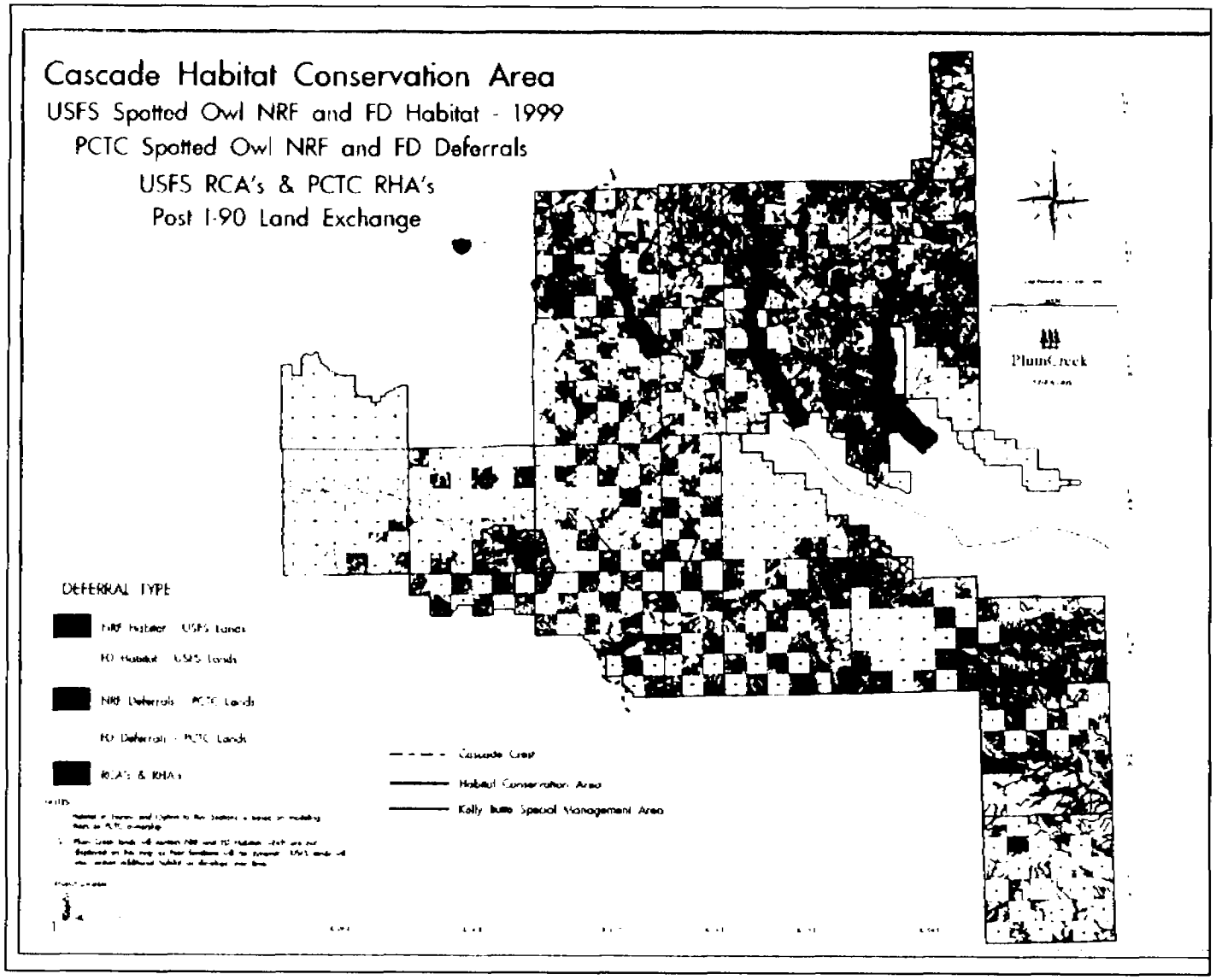

Figure 5. Map of northern spotted owl nesting and foraging habitat which is likely to be present and located in geographically explicit locations during the first 20 years of the Permit Period following the land exchange. This figure is designed to place habitat deferrals in context. **NOTE:** Plum Creek habitat which will shift locations through time is not displayed.

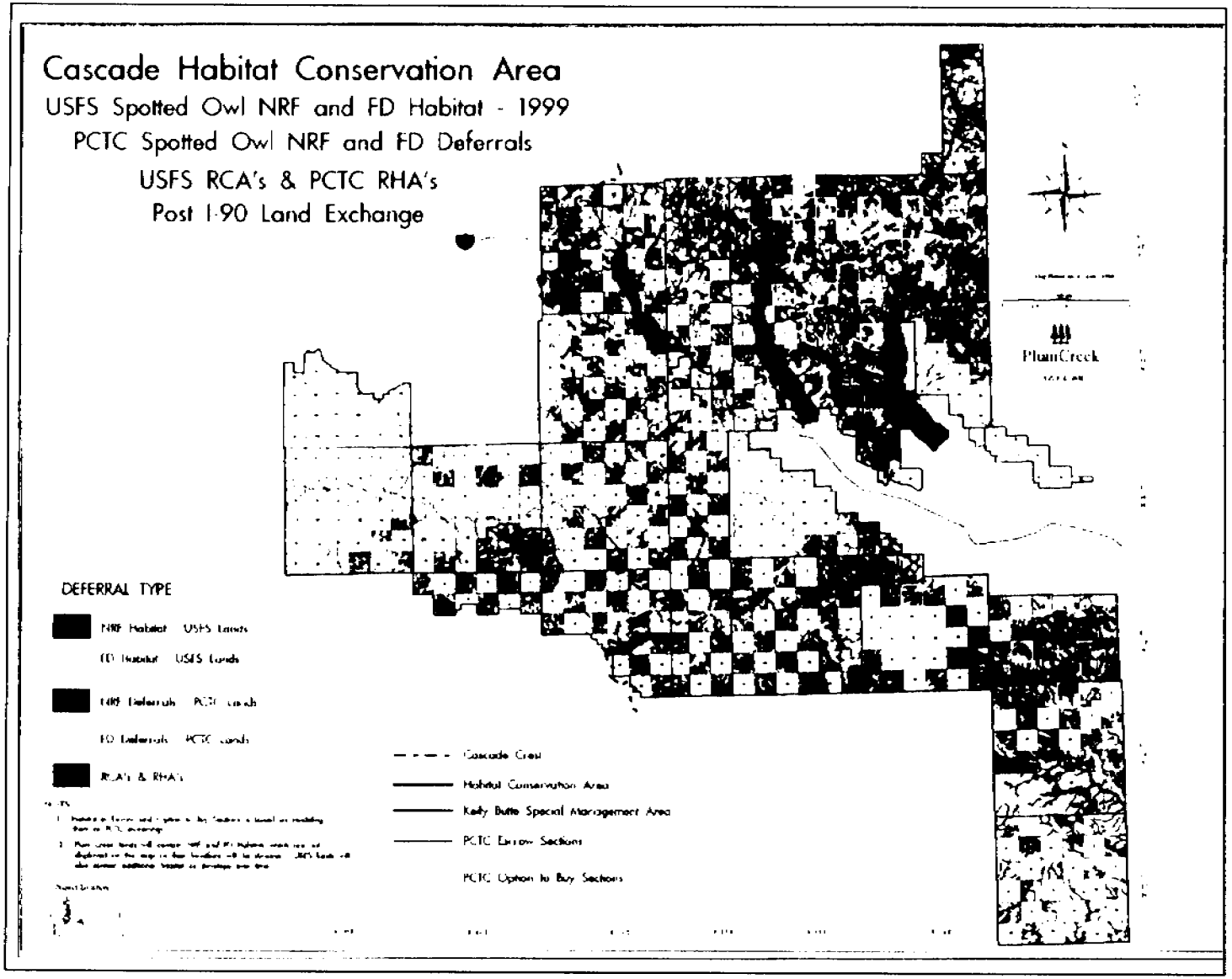

Figure 6. Map of northern spotted owl nesting and foraging habitat which is relatively likely to be maintained following land exchange in spatially explicit locations, with escrow and option lands highlighted. **Note:** Plum Creek habitat which will shift location through time is not depicted.